ORDER NO. HAD8608682C0
A6

Service Manual

Compact Disc Player

SL-PJ20

SL-PJ20

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

Color	Areas
(K)	[M] ..... U.S.A.
(K)	[MC] ... Canada.
(K) (S)	[E] ..... Switzerland and Scandinavia.
(K) (S)	[EK] .... United Kingdom.
(K) (S)	[XL] .... Australia.
(K) (S)	[EG] .... F.R. Germany.
(K) (S)	[EB] .... Belgium.
(K) (S)	[EH] .... Holland.
(K) (S)	[EF] .... France.
(K) (S)	[Ei] ..... Italy.
(K) (S)	[XA] .... Asia, Latin America, Middle Near East, Africa and Oceania.
(K) (S)	[XB] .... Saudi Arabia.

Color

(K) ..... Black Type
(S) ..... Silver Type

SECIFICATIONS (*Measured by EIAJ (CP-307))

■ Audio

No. of channels:	2 (left and right, stereo)
Frequency response:	4—20,000 Hz ±0.5 dB*
Dynamic range:	More than 92 dB*
S/N ratio:	More than 96 dB*
Harmonic distortion:	0.004% (1 kHz, 0 dB)
Total harmonic distortion:	0.006% (1 kHz, 0 dB)*
Channel separation:	More than 96 dB*
Wow and flutter:	Below measurable limit*
Low-pass filter:	High-resolution digital filter

■ Signal Format

Sampling frequency:	44.1 kHz
Correction system:	Technics Super Decoding Algorithm
D-A conversion:	16-bit linear

■ Pickup

Type:	Fine-focus, one beam FF-1
Access time:	1 second* (access to the last track)*
Light source:	Semiconductor laser
Wavelength:	780 nm
Traverse system:	High-speed linear access system
Spindle system:	Brushless DD motor

■ Functions

Automatic play:	All tracks.
Random access play:	Track number.
Repeat play:	Entire disc or programmed tracks.
Search:	Forward/backward track skip. Forward/backward manual search.
Program play:	For up to 20 selections
Preset edit play:	Up to 99 minutes (for program play)
Display:	Total tracks. Current track.
Time display:	• Time display (min., sec.). • The following four time modes display minutes and seconds according to the time mode select button setting: ① Disc remaining playing time. ② Track number and remaining playing time of the current track. ③ Playing time from the beginning of the first track. ④ Track number and elapsed playing time from the beginning of the current track.
Indicator:	Play indicator. Pause indicator. Repeat indicator. Disc indicator.
Disc loading:	Motor-driven horizontal type.

06030340 91004988 37
SM-SLPJ20 1 ST
SVC MNL

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■ General

Power supply: For U.S.A. and Canada: AC 120 V, 60 Hz
For United Kingdom and Australia: AC 240 V, 50 Hz
For Continental Europe: AC 220 V, 50 Hz
For Others: AC 110~127/220~240 V, 50/60 Hz

Power consumption: 10 W

Output voltage: 2 V (at 0 dB)*

Output impedance: Approx. 550Ω

Load impedance: More than 10 kΩ

Dimensions (W×D×H): 31.5×24×7.6 cm (12-13/32"×9-7/16"×3") [When disc holder is opened: 37.2 cm (14-21/32") (D)]

Weight: 3 kg (6.6 lbs.)

Specifications are subject to change without notice for further improvement.
Weight and dimensions are approximate.

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■ SAFETY PRECAUTION

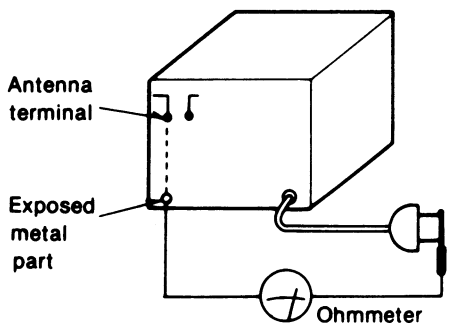
(This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

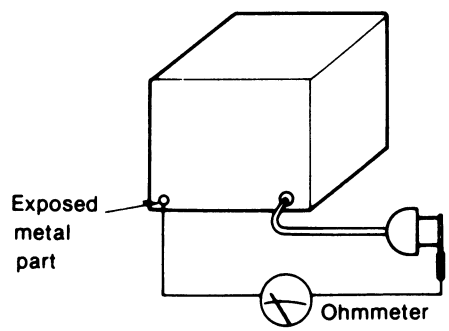
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



(Fig. B)

Resistance = Approx ∞

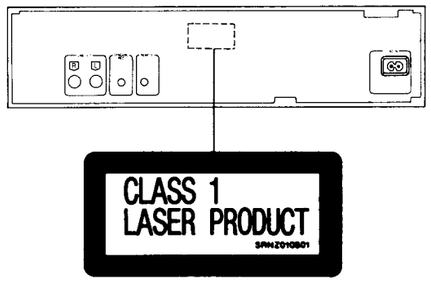
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ PRECAUTION OF LASER DIODE

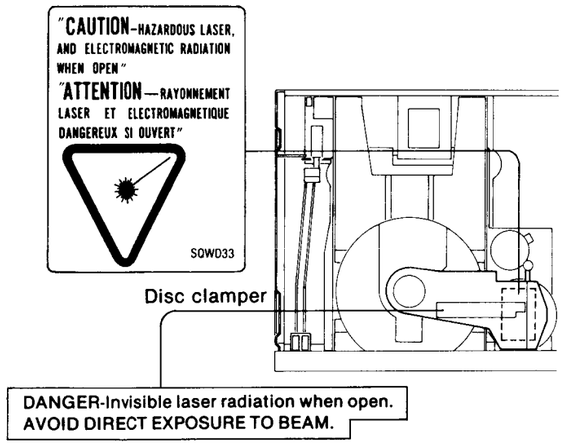
Caution: This product utilizes a laser diode.
ADVARSEL: I dette a apparat anvendes laser.

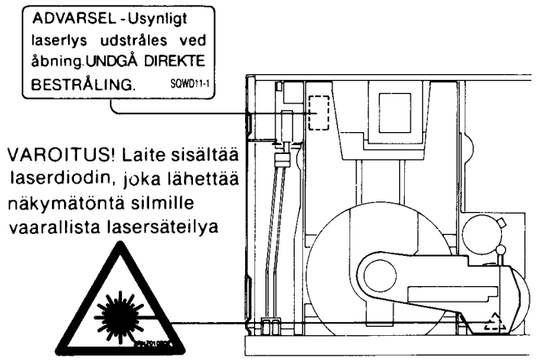
- **Use of caution labels** Note: ○ Mark is used, × Mark is not used.

Areas	Disc clamper	SQWD33	SQWD11-1	SRNZ010S01	SRNZ010S02
[M]	○	×	×	×	×
[MC]	○	○	×	×	×
[E]	○	×	○	○	○
[EK], [XL], [EG] [EB], [EH], [EF] [Ei], [XB], [XA]	○	×	×	○	○



Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

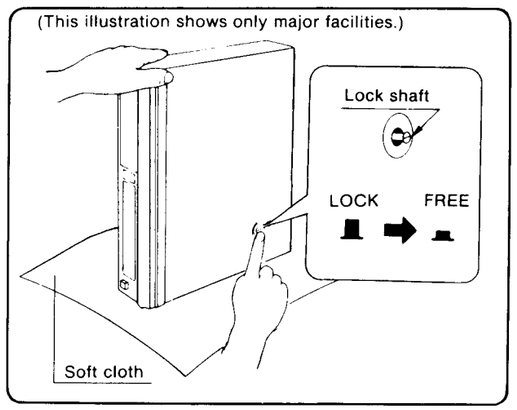

"CAUTION-HAZARDOUS LASER, AND ELECTROMAGNETIC RADIATION WHEN OPEN"
"ATTENTION—RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT"
SQWD33
Disc clamper
DANGER-Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.


ADVARSEL - Usynligt laserlys udstråles ved åbning. UNDGÅ DIREKTE BESTRÅLING.
SQWD11-1
VAROITUS! Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilya

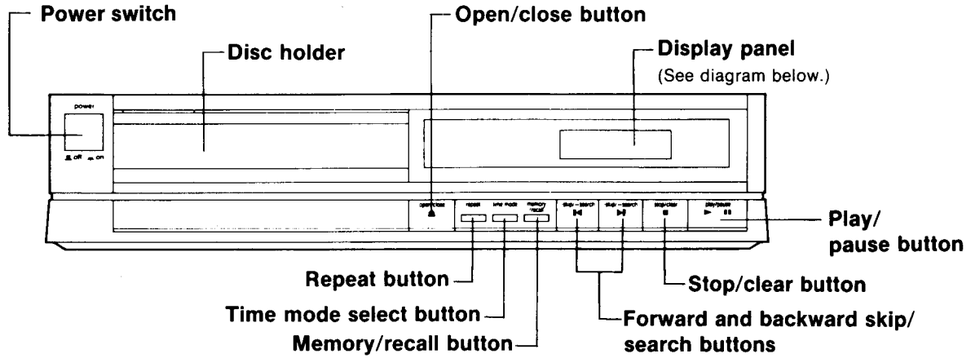
■ BEFORE USING THIS UNIT

1. Place a soft cloth under the unit to protect it from scratches.
2. Press the lock shaft on the bottom panel to the in (FREE) position (LOCK→FREE).

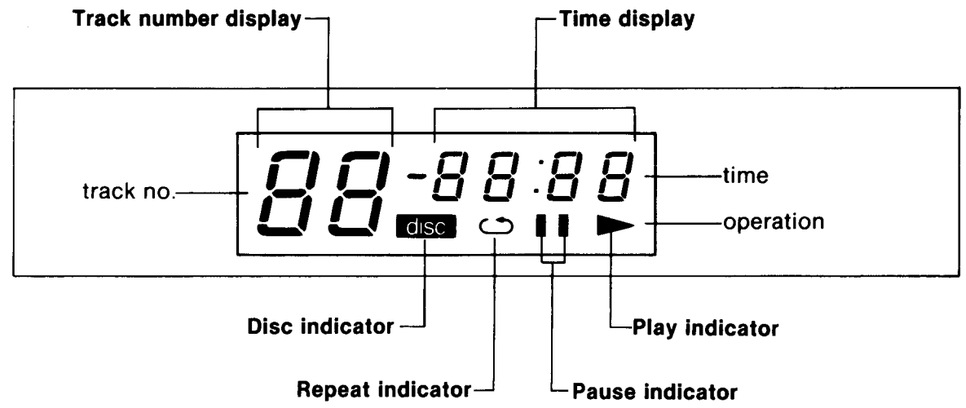
NOTE:
IF THE UNIT IS TRANSPORTED AGAIN, PERFORM THE FOLLOWING STEPS:
1) Remove the disc from the holder.
2) Pull the lock shaft to the out (LOCK) position (FREE→LOCK).
CAUTION:
Do not transport the unit without locking the lock shaft.
SEVERE DAMAGE WILL RESULT.



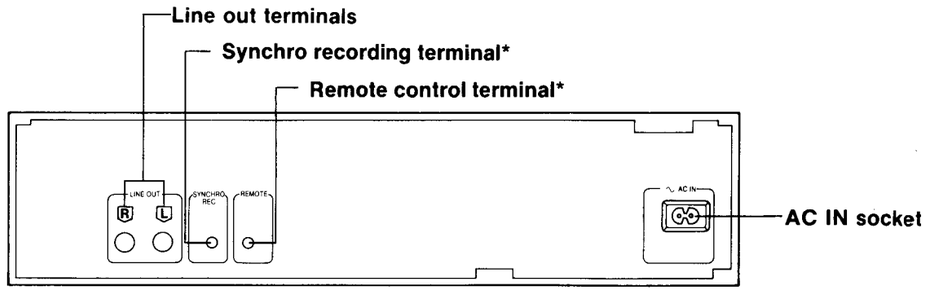
■ LOCATION OF CONTROLS



(Display panel)



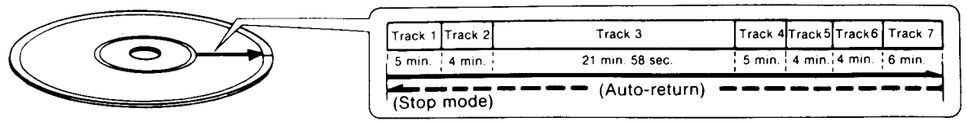
(Rear panel of player)



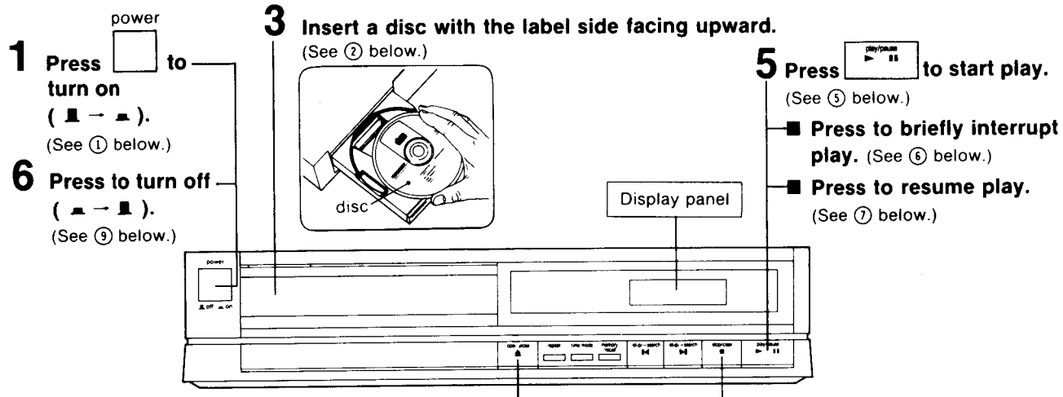
* The product for the U.S.A. and Canada is not provided with the Synchro-recording terminal and the Remote control terminal.

Playing a disc

All of the examples on pages 6—10 refer to a disc which contains 7 tracks and has a total playing time of 49 minutes and 58 seconds.



1 Automatic play (To play a disc from beginning to end.)


power
1 Press to turn on (→).
(See ① below.)
6 Press to turn off (→).
(See ⑨ below.)
3 Insert a disc with the label side facing upward.
(See ② below.)
disc
Display panel
5 Press to start play.
(See ⑤ below.)
■ Press to briefly interrupt play. (See ⑥ below.)
■ Press to resume play.
(See ⑦ below.)
2 Press to open disc holder.
4 Press to close disc holder.
(See ③, ④ below.)
■ Press to stop play.
(See ⑧ below.)

① Display momentarily illuminates as shown below:

Afterwards the display reads all zeros as shown in ④.

② Insert the disc only after the disc holder has opened all the way. If the disc is inserted too soon, it may be damaged. Do not tilt the unit while the disc holder is opening or closing since the disc could fall out of the holder.

③ Step 4 can be skipped by pressing the play/pause button after inserting a disc. In this case, the holder will close and disc play will begin directly from track 1, but the tracks and total playing time will not be displayed.

④ If the open/close button is pressed, the display illuminates as shown below.

Disc information is being read.

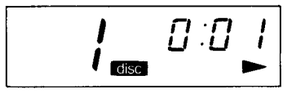
↓

Reading of disc information finished.

↓

Stop mode.

⑤ • The play indicator (▶) illuminates and play begins.



• After the last track has been played the pickup returns to the beginning of the first track and the unit switches to the stop mode.

⑥ The play indicator (▶) goes out, the pause indicator (❚❚) illuminates and the unit switches to the pause mode.

⑦ The pause mode is cancelled, play is resumed, and the play indicator illuminates.

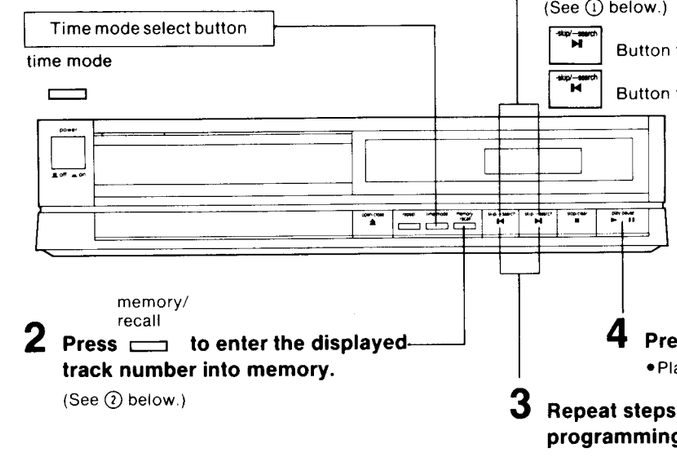
⑧ The pickup will return to the beginning of the first track and the unit will switch to the stop mode.

⑨ When the end of the disc is reached, the pickup returns to the beginning of the first track and the unit switches to the stop mode.
• Remove the disc from the disc holder.
• Turn off the power (mains) if the unit is not to be used again for a while.

• Since steps 1, 2, 3, 4 and 6 in this procedure are the same for all play procedures, they are not included in the following explanations.

2 Program play (When the unit is in the stop mode.)

Notes:
• Program entries cannot be made during play or pause mode.
• Press the repeat button before starting program play if you wish to skip backward during program play.


Time mode select button
time mode
memory/ recall
2 Press to enter the displayed track number into memory.
(See ② below.)
1 While watching the track number display, press momentarily to specify the desired track number.
(See ① below.)
Button to move the pickup forward.
Button to move the pickup backward.
4 Press to start play.
• Play begins from the first programmed track.
3 Repeat steps 1 and 2 until the desired programming is complete.
or
memory/ recall
(See ③ below.)
(A maximum of 20 selections can be programmed.)

① • If more than 20 selections are entered, "F" (full) is shown in the display panel and no further selections can be programmed.

• Keeping the button (or button) pressed will cause the track number display to advance (or go back) continuously.

• When the button is kept pressed continuously, the track number display returns to the first track after passing the last track on the disc. For example, if there are 7 tracks on the disc, keeping the button pressed, would display the track numbers as follows:

→ 1 → 2 → 3 → 4 → 5 → 6 → 7 →

• Likewise, keeping the button pressed results in the following display:

← 1 ← 2 ← 3 ← 4 ← 5 ← 6 ← 7 ←

② To enter the same track number several times in succession, simply press the memory/recall button the same number of times that the track is to be played.
Each entry counts as one selection.

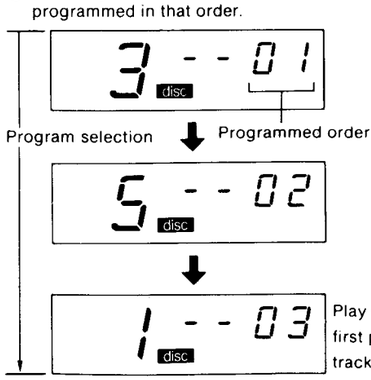
Total playing time confirmation

To display the total playing time of all programmed tracks.
Example: If tracks 3, 5 and 1 are specified and the time mode select button is pressed, 30 minutes 58 seconds is displayed.

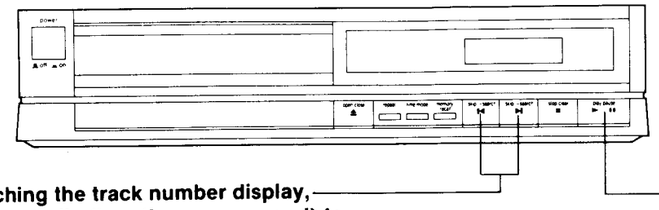
time mode

Press.

③ The diagram below shows track 3, track 5 and track 1 programmed in that order.



3 Random access play (When the unit is in the stop mode.)



1 While watching the track number display, press momentarily (less than one second) to specify the desired track. (See ① below.)

skip/search ⏭ Button to move the pickup forward.

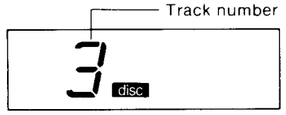
skip/search ⏮ Button to move the pickup backward.

2 Press play/pause ►II to start play.

- Play begins from the first programmed track. (See ② below.)

① The display below shows track 3 is specified.

Track number



② The play indicator (►) illuminates and play begins from track 3.

4 Skip play

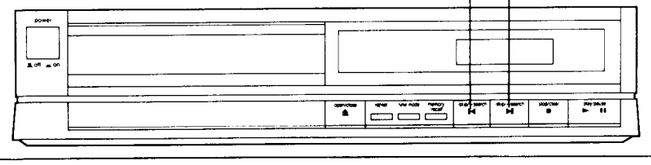
(During play or in the pause mode.)

■ Forward or backward track skip play

■ **While watching the track number display, press the forward or backward skip/search button momentarily to locate the desired track.** (See ① below.)

skip/search ⏭ Forward skip/search button (Pickup skips forward)

skip/search ⏮ Backward skip/search button (Pickup skips backward)



① Momentarily pressing one of the skip buttons activates the quick skip mode.

Forward skip

- During automatic play, the pickup skips to the beginning of the next track each time the button is pressed.
- During program play or program repeat play, the pickup skips to the beginning of the next programmed track each time the button is pressed.

Backward skip

- During automatic play, the pickup skips to the beginning of the current track. If pressed again quickly, the pickup skips to the beginning of the previous track.
- During program play (repeat function not activated), the pickup skips backward only to the beginning of the current track.
- During program repeat play, the pickup skips to the beginning of the current track. If pressed again quickly, the pickup skips to the beginning of the previous programmed track.

5 Manual search play

(During play or in the pause mode.)

■ To play the disc from a specific point

■ **Keep the forward or backward skip/search button pressed to move the pickup forward or backward. Release the button when the desired point has been reached (as shown by the display).** (See ② below.)

skip/search ⏭ Forward skip/search button (Pickup moves forward)

skip/search ⏮ Backward skip/search button (Pickup moves backward)

② • The pickup moves slowly at first and then rapidly if one of the buttons is held down for more than about 3 seconds.
- If one of the buttons is pressed while a disc is being played, sound from the disc can be heard as the pickup moves. The output level at this time is decreased by −12 dB (1/4) compared with the normal level.
- During program play, the pickup can only be moved between the beginning and end of the track currently being played.

6 Preset edit play

(When the unit is in the stop mode.)

Note:
It is possible to specify preset edit time using remote control unit.

Procedure

Confirm that the unit is in the stop mode.

1. Press the time mode select button.
2. Press the forward or backward skip/search button to specify the playing time in minutes.
3. Press the memory/recall button. (For automatic play or repeat play, this step may be omitted.)
4. Press the play/pause button.
5. After playing the preset edit time the unit switches to the pause mode.

Notes:

- If a preset edit time that is longer than the recorded playing time is specified, the unit switches to the stop mode after the last track has been played.
- A maximum time of 99 minutes may be specified for program disc play.
- If you operate the search or skip function during preset edit play, preset edit play is cancelled.
- For preset edit play during program play, the preset edit time must be specified before the program selections are entered.

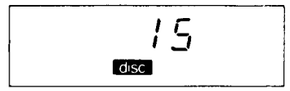
Function

Preset edit play

For example, to play only 15 minutes:

1. time mode □ **Press.**

2. ⏭ or ⏮ **Press.** (Specify 15 minutes.)



3. memory/recall □ **Press.**

4. play/pause ►II **Press.**

(The above illustration shows a disc containing more than 15 minutes within the first track.)

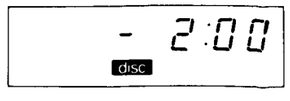
- During automatic play, the unit switches to the pause mode after playing for 15 minutes.
- During program play, the unit switches to the pause mode after playing for 15 minutes, and the next programmed track is displayed if there is a further programmed track.
- During repeat play, the unit switches every 15 minutes to the pause mode. (Play is restarted by pressing the play/pause button.)

The time mode button can also be used for the following function.

Remaining specified time confirmation

To display the remaining specified time.
Example: If 15 minutes has been specified and then tracks 2→4→6 are programmed, pressing the time mode select button displays the remaining playing time between the end of the last programmed track and the specified preset edit time of 15 minutes.

In the example, track 2 has a playing time of 4 minutes, track 4 of 5 minutes and track 6 of 4 minutes, therefore the displayed remaining playing time is 2 minutes (15 minutes minus 13 minutes).

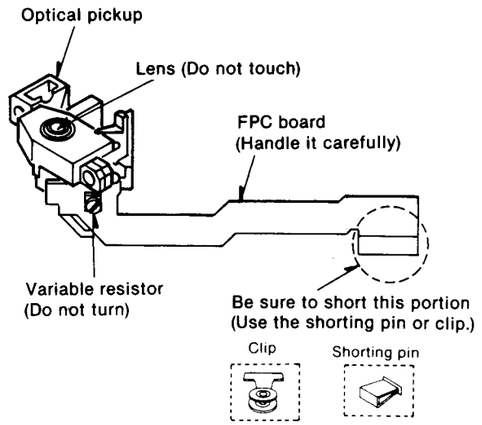


■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.

• Handling of optical pickup

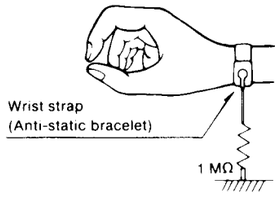
1. Do not give excessive shock to the optical pickup because it is of extremely precise structure.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. **(FPC board)**
   When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board. **(FPC board)**
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

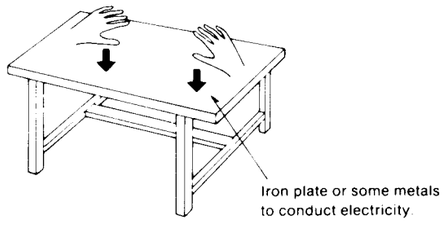


• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to relieve the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.

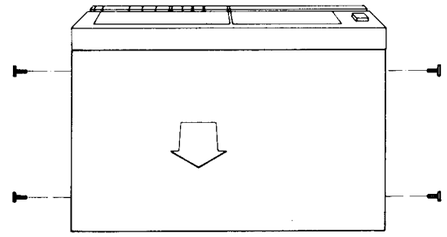




■ DISASSEMBLY INSTRUCTIONS

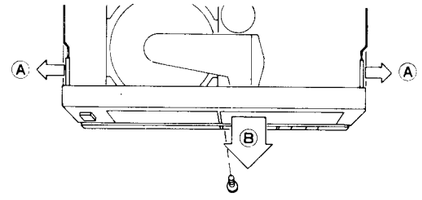
CAUTION:
- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When doing the job, removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.

Ref. No. 1	How to remove the top case
Procedure 1	• Remove the 4 setscrews.

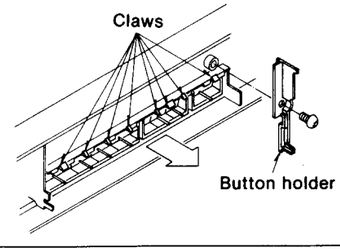


Note: When doing the job, Lock the lock shaft at bottom of the unit. (See page 3)

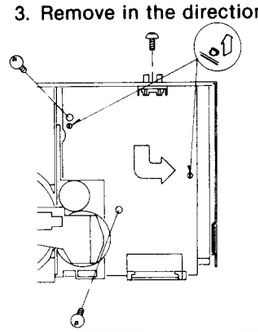
Ref. No. 2	How to remove the front panel
Procedure 1 → 2	1. Remove the setscrew. 2. Slightly pull the tabs outward (arrows Ⓐ). 3. Remove in the direction of the arrow Ⓑ.



Ref. No. 3	How to remove the operation button
Procedure 1 → 2 → 3	1. Remove the setscrew and button holder. 2. Release the 8 claws.



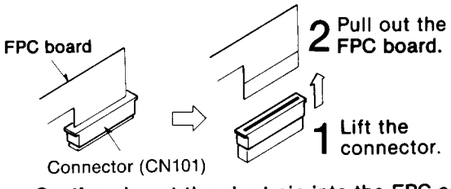
Ref. No. 4	How to remove the main P.C.B.
Procedure 1 → 2 → 4	1. Remove the 3 setscrews. 2. **Lift the P.C.B. to remove it from the chassis tabs.** 3. Remove in the direction of the arrow.



How to check the main P.C.B.

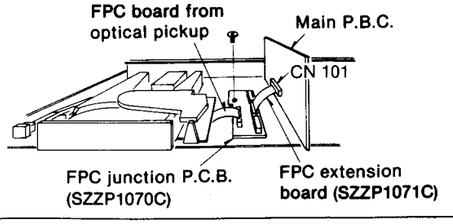
• When checking the soldered surfaces of the main P.C.B. and replacing the parts, do as shown.

1. Remove the main P.C.B.
2. Remove the FPC board (CN101).



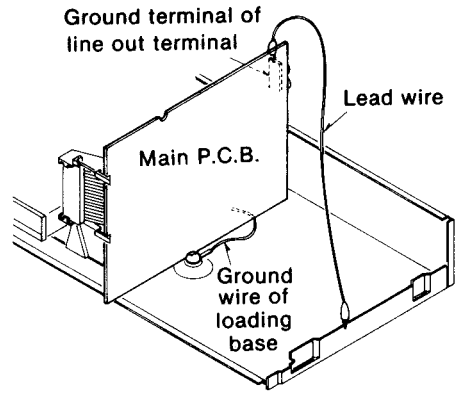
Caution: Insert the short pin into the FPC cord in order to prevent breakdown of laser diode. (See page 9)

3. Mount FPC junction P.C.B. (SZZP1070C) on the chassis. (Do the job as shown by using the main P.C.B. setscrew.)
4. Connect FPC board from optical pickup to FPC junction P.C.B.
5. Connect FPC extension board (SZZP1071C) to FPC junction P.C.B. and CN101 of main P.C.B.

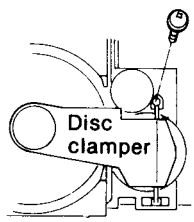


6. Place the main P.C.B. as shown in the figure.

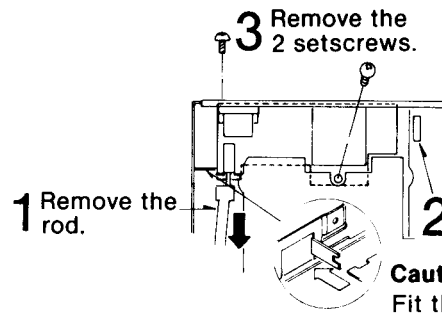
Cautions:
1. Be sure to connect the P.C.B. ground terminal (line out terminal) and chassis lead wire.
2. Connect the ground wire of loading base to the chassis.



Ref. No. 5	How to remove the disc clamper
Procedure 1 → 5	• Remove the setscrew.



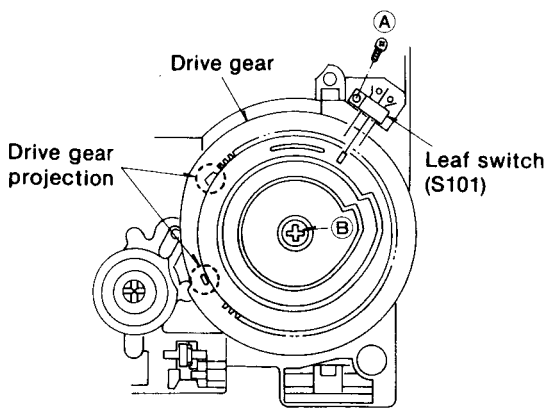
Ref. No. 6	How to remove the power supply P.C.B.
Procedure 1 → 6	• Remove in the numerical order shown. (Shift the disc holder forward.)



Caution for fitting
Fit the P.C.B. in the groove of chassis.

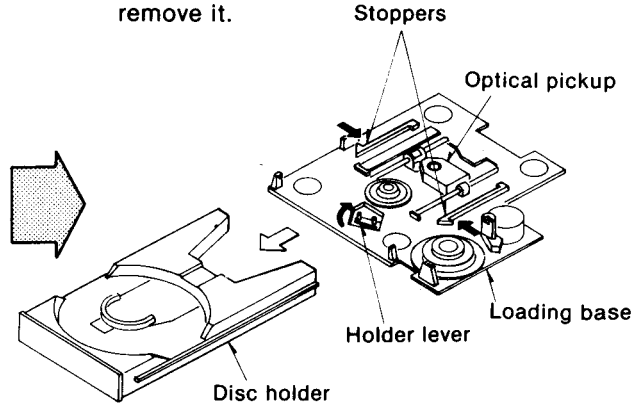
Ref. No. 7	How to remove the disc holder (disc tray)
Procedure 1 → 2 → 5 → 7	

• **Set the drive gear as shown below.**
(Turn it completely to the right, then turn it to the left by about 20° so that drive gear teeth or projection will not touch the rack of disc holder.)



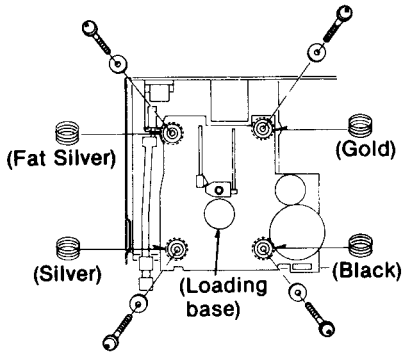
• **To remove the drive gear**
Remove the screw Ⓐ of leaf switch (S101), then remove the drive gear setscrew Ⓑ.

1. Push the holder lever backward, (From underneath the loading base.)
2. Pull the disc holder and bend the 2 claws of disc holder stopper of loading base toward the optical pickup.
3. Further pull out the disc holder to remove it.



• **Caution for fitting**
When fitting the disc holder, make the drive gear as shown on the left, and then insert the disc holder along the guide of loading base.
After inserting the disc holder completely, turn the drive gear to the right completely.

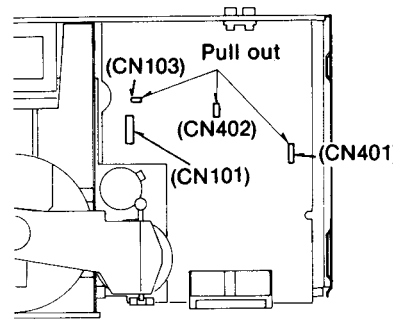
Ref. No. 8	How to remove the loading base
Procedure 7 → 8	Note: Lock the lock shaft at the bottom of the unit. • Remove the 4 setscrews.



Note the color of each spring, they must be reinstalled in their original position.

Refer to the optical pickup handling precautions (See page 9).

1. Pull out the 3 connectors (CN103, 401, 402).
2. Remove the FPC board (CN101).

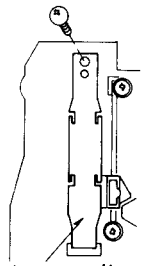


Caution: Insert the short pin into the FPC board in order to prevent breakdown of laser diode. (See page 9)

Ref. No. 9	How to remove the optical pickup
Procedure 7 → 8 → 9	• Follow the numerical order shown.

Refer to the optical pickup handling precautions (See page 9).

1 Remove the screw.

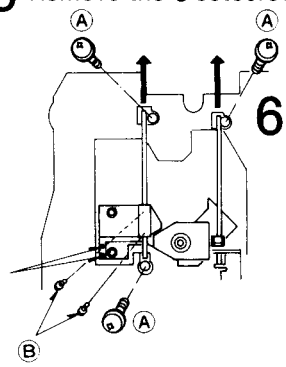


Resistance unit (Speed sensor)

2 Remove the resistance unit.

3 Unsolder the 2 terminals.

5 Remove the 3 setscrews Ⓐ.

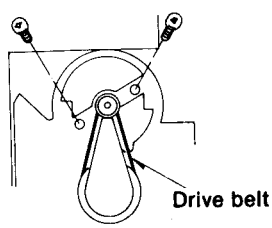


6 Pull out the optical pickup from the 2 guide shafts.

4 Remove the 2 setscrews Ⓑ. (Underneath)

Ref. No. 10	How to remove the drive motor
Procedure 7 → 8 → 10	• Follow the numerical order shown.

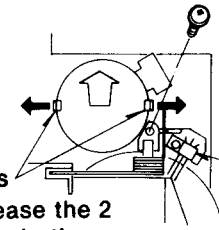
2 Remove the 2 setscrews.



1 Remove the drive belt.

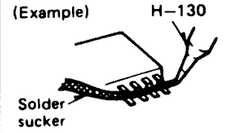
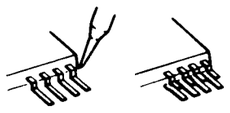
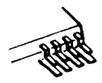
5 Lift up the drive motor.

3 Remove the setscrew.



4 Release the 2 Tabs in the direction of the arrows.

■ HOW TO REPLACE IC'S (Small outline type)

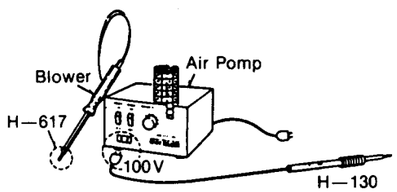
	Replacing procedure		Cautions
1	Reduce the amount of solder on each pin of the integrated circuit by use of a solder sucker.	(Example) H–130 	• Recommended tool .....Special soldering iron * H605M and H-130. * H605E and H-130. • Do not touch the soldering iron to the area for a long time. It may otherwise cause removal of the print foil. • When shifting the pin upward, do the job quickly while the solder is melting. If the solder is hard, it may cause removal or breakage of the print foil. • When using a pencil type soldering iron. 1. Completely remove the solder from each IC pin by use of solder sucker. 2. Raise each pin by means of an eyeleteer, hold the pliers then remove IC package from P.C.B.
2	Melt the solder on the pin (one electrode) with the soldering iron.		
3	While the solder is melting, shift the pin upward by the soldering iron to remove it from the foil.		
4	Remove each pin from the foil according to the above-mentioned procedure.		

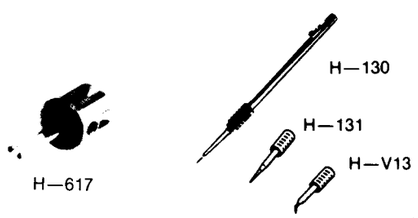
*** Special soldering iron**
(Refer to Technical Information, ORDER NO. GAD84125486T1)...For U.S.A. and Canada
(Refer to Technical Information, ORDER NO. GAD84115476T8)...For others

•H–605 Spot Heater (hot-air solder iron)

This device that uses hot air to melt solder was developed to remove Flat-Package ICs, RHCs and chip parts.

- H–605M (For 120V power source)
- H–605E (For 200V/220V/240V power source)





•H–617 Twin Nozzle (for spot heater)

Special nozzle for the removal of RHCs and chip resistors. (Nozzle diameter: 1.0mm×2)

•H–130 Slim Pencil Solder Iron

An ultrasmall ceramic heater solder iron is extremely handy for soldering chip parts, RHCs, ICs etc., to high-density circuit boards.

Features:

- Rated power: 100V, 15W
- Max. temp.: 400°C
- Heater: ceramic (long life)
- Insulation resistance: 100MΩ
- Length: 178mm
- Weight: 16g (not including cord)

•H–131, H–V13 Cap Bits

Solder tip for the slim pencil Solder Iron is composed of a bit holder and a corrosion resistance solder tip.
Permits changing of solder tips even while still hot.

- Solder tip: 0.3mm

■ RESISTORS & CAPACITORS

Notes: * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area.
Parts without these indications can be used for all areas.

Numbering System of Resistor

Example

ERD	25	F	J	102
Type	Wattage	Shape	Tolerance	Value

ERX	2	AN	J	471
Type	Wattage	Shape	Tolerance	Value 47x10¹ (ohm)

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	330
Type	Voltage	Peculiarity	Value (33x10° microfarad)

Resistor Type	Wattage	Tolerance
ERD : Carbon ERG : Metal Oxide ERX : Metal Film ERQ : Fuse Type Metal ERD□ L : Carbon (chip) ERQ□ K : Metal Film (chip) ERC : Solid	10 : 1/8W 12 : 1/2W 25 : 1/4W 1A : 1W 18 : 1/8W S2 : 1/4W S1 : 1/2W 2F : 1/4W 50 : 1/2W 2A : 2W	J : ±5% F : ±1% G : ±2% K : ±10%

Capacitor Type	Voltage	Tolerance
ECE : Electrolytic ECCD : Ceramic ECKD : Ceramic ECQM : Polyester ECQP : Polyproylene ECG : Ceramic ECEA□□□N: Non Polar Electrolytic QCU□ : Ceramic (Chip Type) ECUX : Ceramic (Chip Type) ECF : Semiconductor EECW : Liquid electrolyte double layer capcitor	0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1H : 50V 1V : 35V 50 : 50V 05 : 50V 2H : 500V 2A : 100V 1 : 100V KC: 400V AC KC: 125VAC (UL) 1J : 63V	C : ±0.25pF J : ±5% K : ±10% Z : +80% –20% P : +100% –0% M : ±20% D : ±0.5pF G : ±2%

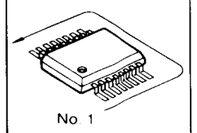
Ref. No.	Part No.	Part Code
RESISTORS		
R11, R12	ERDS2TJ681	001 152 2449 8
R13	ERDS2TJ221	001 152 2431 8
R14	ERDS2TJ101	001 152 2421 0
R15, R16	ERDS2TJ561	001 152 2364 2
R17	ERDS2TJ222	001 152 2353 5
R18	ERDS2TJ392	001 152 2439 0
R19	ERDS2TJ103	001 152 2347 3
R20	ERDS2TJ332	001 152 2357 1
R21	ERDS2TJ153	001 152 2351 7
R22, R23	ERDS2TJ682	001 152 2365 1
R24, R25	ERDS2TJ471	001 152 2361 5
R26	ERDS2TJ471	001 152 2361 5
R27	ERDS2TJ392	001 152 2439 0
R101	ERDS2TJ154	001 152 2427 4
R102, R103	ERDS2TJ472	001 152 2362 4
R104	ERDS2TJ223	001 152 2432 7
R105	ERDS2TJ334	001 152 2438 1
R107	ERDS2TJ683	001 152 2450 5
R108	ERDS2TJ332	001 152 2357 1
R109	ERDS2TJ822	001 152 2455 0
R110, R111	ERDS2TJ682	001 152 2365 1
R112	ERDS2TJ822	001 152 2455 0
R113, R114	ERDS2TJ182	001 152 2352 6
R115	ERDS2TJ102	001 152 2346 4
R116, R117	ERDS2TJ182	001 152 2352 6
R118	ERDS2TJ102	001 152 2346 4
R119	ERDS2TJ471	001 152 2361 5
R120	ERDS2TJ120	001 152 3146 6
R122	ERDS2TJ471	001 152 2361 5
R141	ERDS2TJ102	001 152 2346 4
R142	ERDS2TJ333	001 152 2358 0
R143	ERDS2TJ224	001 152 2433 6
R144	ERDS2TJ333	001 152 2358 0
R145	ERDS2TJ153	001 152 2351 7
R146	ERDS2TJ122	001 152 2423 8
R147	ERDS2TJ682	001 152 2365 1
R148	ERDS2TJ104	001 152 2348 2
R149	ERDS2TJ152	001 152 2350 8
R150	ERDS2TJ103	001 152 2347 3
R151	ERDS2TJ101	001 152 2421 0
R152	ERDS2TJ153	001 152 2351 7
R153	ERDS2TJ270	001 152 2434 5
R154	ERDS2TJ3R3	001 152 3152 8
R161	ERDS2TJ333	001 152 2358 0
R162	ERDS2TJ222	001 152 2353 5
R163	ERDS2TJ333	001 152 2358 0
R164	ERDS2TJ153	001 152 2351 7
R165	ERDS2TJ122	001 152 2423 8
R166	ERDS2TJ102	001 152 2346 4
R167	ERDS2TJ681	001 152 2449 8
R168	ERDS2TJ272	001 152 2354 4
R169	ERDS2TJ392	001 152 2439 0
R170	ERDS2TJ101	001 152 2421 0
R171	ERDS2TJ270	001 152 2434 5
R172	ERDS2TJ3R3	001 152 3152 8
R180	ERDS2TJ474	001 152 2443 4
R181	ERDS2TJ222	001 152 2353 5
R182, R183	ERDS2TJ564	001 152 2447 0
R184	ERDS2TJ472	001 152 2362 4
R185, R186	ER0S2TKF4702	001 151 5723 2
R187, R188	ER0S2TKF4702	001 151 5723 2
R189	ERDS2TJ123	001 152 2424 7
R190	ERDS2TJ332	001 152 2357 1
R191	ERDS2TJ154	001 152 2427 4
R192	ERDS2TJ824	001 152 2457 8
R193	ERDS2TJ101	001 152 2421 0
R194	ERDS2TJ683	001 152 2450 5
R195, R196	ERDS2TJ103	001 152 2347 3
R197	ERDS2TJ473	001 152 2363 3
R198	ERDS2TJ333	001 152 2358 0
R301	ERDS2TJ102	001 152 2346 4
R302	ERDS2TJ472	001 152 2362 4
R303, R304	ERDS2TJ102	001 152 2346 4
R305	ERDS2TJ104	001 152 2348 2
R307	ERDS2TJ471	001 152 2361 5
R308	ERDS2TJ121	001 152 2349 1
R309	ERDS2TJ472	001 152 2362 4
R401, R402	ERDS2TJ223	001 152 2432 7
R403	ERDS2TJ472	001 152 2362 4
R404, R406	ERDS2TJ394	001 152 2441 6
R407	ERDS2TJ152	001 152 2350 8
R408, R409	ERDS2TJ472	001 152 2362 4
R410, R411	ERDS2TJ472	001 152 2362 4
R412, R413	ERDS2TJ472	001 152 2362 4
R414, R415	ERDS2TJ472	001 152 2362 4
R416	ERDS2TJ913	001 152 3708 4
R417	ERDS2TJ124	001 152 2425 6
R418	ERDS2TJ913	001 152 3708 4
R419	ERDS2TJ124	001 152 2425 6
R420	ERDS2TJ101	001 152 2421 0
R423	ERDS2TJ103	001 152 2347 3
EXCEPT (M,MC)		
R424	ERDS2TJ473	001 152 2363 3
EXCEPT (M, MC)		
R425, R426	ERDS2TJ103	001 152 2347 3
R427, R428	ERDS2TJ103	001 152 2347 3
R429, R430	ERDS2TJ222	001 152 2353 5
EXCEPT (M, MC)		
R431, R432	ERDS2TJ222	001 152 2353 5
EXCEPT (M, MC)		
R433	ERDS2TJ103	001 152 2347 3
R434	ERDS2TJ472	001 152 2362 4
R501, R502	ERJ8GEXK1R5	001 151 6260 8
R503	ERJ8GEYJ223	001 151 5630 6
R801, R802	ERDS2TJ222	001 152 2353 5
R803, R804	ERDS2TJ272	001 152 2354 4
R805, R806	ERDS2TJ221	001 152 2431 8
R807, R808	ERDS2TJ391	001 152 2360 6
R809, R810	ERDS2TJ473	001 152 2363 3
R817, R818	ERDS2TJ102	001 152 2346 4
R819, R820	ERDS2TJ102	001 152 2346 4
R821	ERDS2TJ103	001 152 2347 3
CAPACITORS		
C1 ⚠	ECKDKC103PF2	001 103 3734 7
C11, C12	ECFD1H104ZF	001 108 0906 2
C13	ECEA1CU470	001 120 2835 0
C14	ECFD1H104ZF	001 108 0906 2
C15, C16	ECEA1CU221	001 120 2833 2
C17, C18	ECFD1H104ZF	001 108 0906 2
C19, C20	REC1A101M0T	001 120 5628 3
C21, C22	ECEA1CU222	001 120 3074 3
C23, C24	ECEA1CU331	001 120 3200 5

■ RESISTORS & CAPACITORS

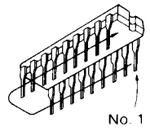
Ref. No.	Part No.	Part Code
C25, C26	ECEA1VU101	001 120 2929 5
C27, C28	ECEA0JS331	001 120 2975 9
C29	REC1A101M0T	001 120 5628 3
C101	ECFD1H104ZF	001 108 0906 2
C102, C103	ECKD1H102KB	001 103 1414 8
C104	ECKD1H681K	001 103 1580 5
C105, C106	ECKD1H471KB	001 103 1551 0
C107	ECCC1H220K	001 103 0493 7
C108	ECEA1HS0R1	001 120 3250 5
C109	ECEA1HU010	001 120 2842 1
C110	ECQM1H104JZ	001 106 0675 8
C111, C112	ECEA1HU100	001 120 3251 4
C113	ECEA1HKNR33	
C114	RCBS1C182MXY	001 103 8660 8
C115	RCBS1C682MXY	001 103 7092 2
C116	ECQM1H333JZ	001 106 0779 1
C117	RCBS1H221KBY	001 103 5603 9
C118	ECEA1HU010	001 120 2842 1
C119	ECEA0JU220	001 120 4670 5
C120	RCBS1H681KBY	001 103 5642 2
C121	ECFTD103KXL	001 108 0341 7
C122, C123	ECCD1H101KB	001 103 5369 0
C124	ECKD1H222KB	001 103 1494 2
C125	ECEA0JU220	001 120 4670 5
C126	ECEA0JU470	001 120 3125 9
C127, C128	ECKD1H102KB	001 103 1414 8
C129	RCBS1H681KBY	001 103 5642 2
C141	ECQM1H153JZ	001 106 0704 0
C142	ECQM1H122JZ	001 106 0683 8
C143	ECQM1H473JZ	001 106 0810 9
C144	ECEA1VSN2R2	001 120 5070 9
C145	ECEA1HSNR22	001 120 4836 1
C161	ECQM1H153JZ	001 106 0704 0
C162	RCBS1H681KBY	001 103 5642 2
C163	ECQM1H103JZ	001 106 0667 8
C164	ECEA1ESN3R3	001 120 5060 1
C165	ECEA1HSN0R1	001 120 4837 0
C181	ECQM1H104JZ	001 106 0675 8
C182	ECCD1H221KB	001 103 3009 9
C183	ECQM1H103JZ	001 106 0667 8
C184	ECEA1HSN010	001 120 3237 2
C186	ECFD1H104ZF	001 108 0906 2
C187	ECEA1VSN2R2	001 120 5070 9
C301	ECCC1H220K	001 103 0493 7
C302	ECCD1H070CC	001 103 0271 9
C303	ECEA1VSN2R2	001 120 5070 9
C304, C305	ECFD1H104ZF	001 108 0906 2
C306	ECFTD103KXL	001 108 0341 7
C307	ECKD1H471KB	001 103 1551 0
C308	ECFD1H104ZF	001 108 0906 2
C309	ECCD1H070CC	001 103 0271 9
EXCEPT (M, MC)		
C310, C401	ECFD1H104ZF	001 108 0906 2
C402	ECEA0JU470	001 120 3125 9
C403	ECFTD103KXL	001 108 0341 7
C404, C405	ECFD1H104ZF	001 108 0906 2
C406	ECCC1H220K	001 103 0493 7
EXCEPT (M, MC)		
C408, C409	ECFTD103KXL	001 108 0341 7
(EG) ONLY		
C414, C416		
(EG) ONLY		
C501	ECEV1EV330	001 120 5624 7
C502	ECEV1HV010	001 120 5625 6
C504	GR426B273K25	001 103 7125 0
C506	GR426B152K50	001 120 5626 5
C507	GR426B104Z25	
C511, C512	ECEA1EN470S	001 120 2394 4
C513	ECEA1EN470S	001 120 2394 4
C801, C802	ECCD1H181KB	001 103 0467 9
C803, C804	RBP1CN220CT	001 120 5015 6
C805, C806	ECKD1H102KB	001 103 1414 8
C810	ECFD1H104ZF	001 108 0906 2
C812	ECQM1H104JZ	001 106 0675 8
C813, C814	RBP1CN220CT	001 120 5015 6
C817	ECFD1H104ZF	001 108 0906 2

• Terminal guide of IC's, transistors and diodes

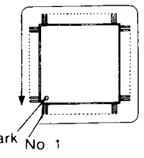
AN8370S.....42 pin
AN8554NS.....14 pin
MN4416S.....24 pin
AN8376S.....28 pin
MN6636S.....10 pin
AN8290S.....24 pin
MN1550PDT.....18 pin



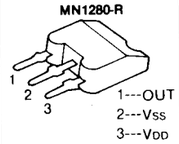
AN6552 .....8 pin
MN15261PDU ....64 pin
SVIPCM54HP-1 ...28 pin



MN6617S.....84 pin
MN6618A.....42 pin

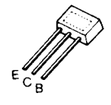


MN1280-R

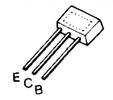


1---OUT
2---Vss
3---VDD

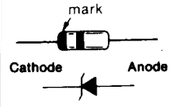
2SC3311



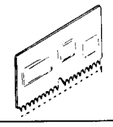
UN4212
UN4113
SVTDTA124EST



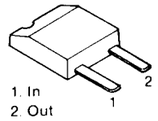
MA4068, MA4056,
MA4091, MA4330

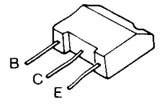


EHDGA1243.....15 pin
SVIGA011.....5 pin



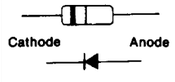
SVIFU15



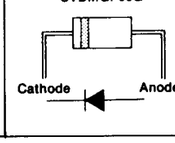


2SB793A
2SD973A
2SD642
2SD637

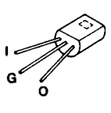
MA165



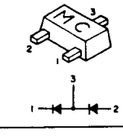
SVDMGP06G



SVIM5236L



MA153



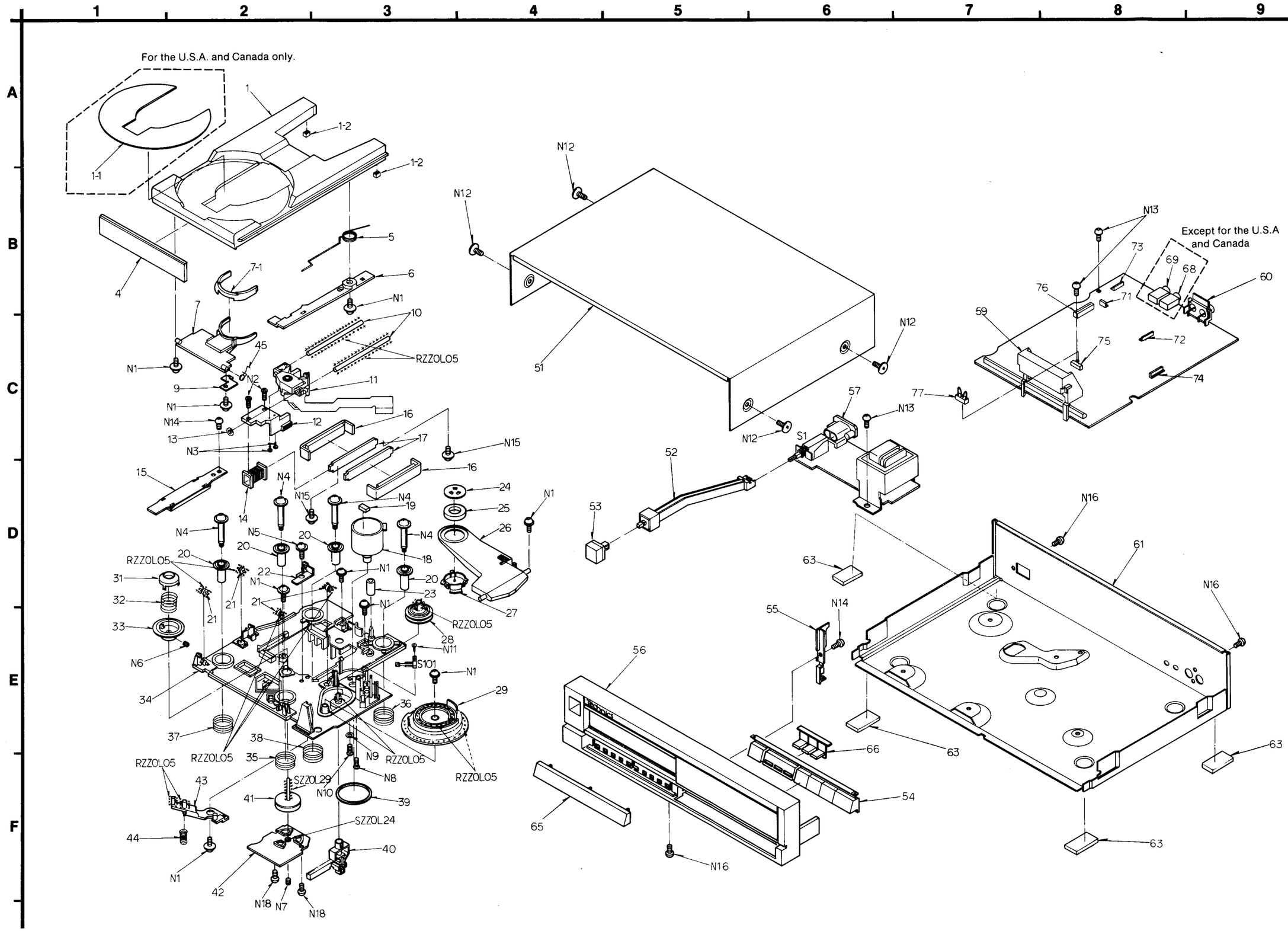
■ REPLACEMENT PARTS LIST

Notes: * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area.
Parts without these indications can be used for all areas.
* "Ⓢ" mark parts are used for silver type only.
* "Ⓚ" mark parts are used for black type only.
Parts other than "Ⓢ" and "Ⓚ" marked are used for both silver and black types.

Ref. No.	Part No.	Part Code	Description
LOADING MECHANICAL			
1 (M, MC)	SIRLP110-KM	016 631 0045 5	DISC TRAY ASS'Y
1 (OTHERS)	SIRLP115-KM	016 631 0051 7	DISC TRAY ASS'Y
1-1 (M) (MC) ONLY	SHSD13	016 655 0646 4	SHEET
1-2	SHGD49	016 653 1079 9	RUBBER
4	SGXD160ZK0A	016 846 3529 3	ORNAMENT PLATE
5	SUSD29-1	016 726 0845 5	SPRING
6	SIRD20	016 718 3355 2	LEVER
7	SIRD16E	016 631 0042 8	HOLDER ASS'Y
7-1	SHGD46	016 653 1080 6	RUBBER
9	SUWD46	016 650 5256 9	BRACKET
10	SUXD25	016 634 0124 2	SHAFT
11 ⚠	S0ALP1200-KM	001 271 0692 3	OPTICAL PICKUP
12	EWSL04A00000	016 631 0044 6	HOLDER
13	SHGD47	016 653 1070 8	RUBBER
14	S0RD10E	001 211 3219 8	COIL
15	EWS7B0A00Q53	001 174 8773 3	RESISTANCE UNIT
16	S0YD8E	016 634 0128 8	YOKE
17	S0YD9	016 634 0125 1	YOKE
18	SJGD4E	002 310 2308 2	MOTOR ASS'Y
19	SHGD64	016 653 1072 6	RUBBER
20	SHGD48-1	016 653 1073 5	RUBBER
21	SDRD2	016 740 0117 8	PULLEY
22	SUWD44	016 650 5250 5	BRACKET
23	SHGD69	016 653 1078 0	RUBBER
24	S0YD2	016 634 0111 7	YOKE
25	S0MD3	003 453 0241 8	MAGNET
26	SIRD17E	016 645 0165 2	CLAMPER
27	SIRD28	016 631 0053 5	HOLDER
28	SDGD19	016 745 0199 5	GEAR
29	SDGD20-1	016 745 0202 7	GEAR
31	SD0D8	005 512 0399 3	RETAINING RING
32	SRQA010N04	017 726 0412 8	SPRING
33	SD0D7-1	016 766 0190 7	TURNTABLE ASS'Y
34	SISD7E	016 827 0313 6	BASE
35	SUSD32-1	016 726 0839 3	SPRING (BLACK)
36	SUSD43	016 726 0842 8	SPRING (GOLD)
37	SUSD44	016 726 0840 0	SPRING (SILVER)
38	SUSD42	016 726 0841 9	SPRING (FAT SILVER)
39	SMBD2-1	016 754 0059 5	BELT
40	SHRD23	016 652 0633 4	LOCK SHAFT
41	S0MA9A	016 743 0060 3	ROTOR ASS'Y
42	SXPD940	003 483 0882 3	SPINDLE PC BOARD ASS'Y
43	SHRD19	016 652 0634 3	LEVER
44	SUSD31	016 726 0843 7	SPRING
45	SUSD51	016 726 0846 4	SPRING

Ref. No.	Part No.	Part Code	Description
CABINET AND CHASSIS			
51 Ⓚ	SKCD50KZ0A	016 800 2908 4	TOP COVER
51 Ⓢ	SKCD50SY0A	016 800 2912 8	TOP COVER
52	SUBD6	016 712 0337 6	ROD
53 Ⓢ	SBC666	016 702 5545 6	BUTTON
53 Ⓚ	SBC666-5	016 702 6679 9	BUTTON
54 Ⓢ	SBCD3801MA0A	016 702 6757 2	BUTTON
54 Ⓚ	SBCD3801ZC0A	016 702 6759 0	BUTTON
55	SHRD22-M	016 650 5257 8	BRACKET
56 Ⓚ (OTHERS)	SGYLPJ20-KE	016 840 7153 9	FRONT PANEL
56 Ⓚ (M) (MC)	SGYLPJ20-KM	016 840 7154 8	FRONT PANEL
56 Ⓢ	SGYLPJ20-SE	016 840 7150 2	FRONT PANEL
57 ⚠ (XL)	SJSD16	003 400 7436 6	AC SOCKET
57 ⚠ (OTHERS)	SJS9236	003 403 4660 7	AC SOCKET
59	SMND7-1	016 631 0050 8	HOLDER
60	SJFD4	003 410 7707 6	TERMINAL
61 (E)	SGPD60ZF0B	016 840 7163 7	CHASSIS
61 (XA) (XB)	SGPD60ZF1A	016 840 7172 6	CHASSIS
61 (M)	SGPD60ZF2A	016 840 7164 6	CHASSIS
61 (OTHERS)	SGPLPJ20-KEB	016 840 7191 3	CHASSIS ASS'Y
61 (EG)	SGPLPJ20-KEG	016 840 7187 9	CHASSIS ASS'Y
61 (EK)	SGPLPJ20-KEK	016 840 7189 7	CHASSIS ASS'Y
61 (MC)	SGPLPJ20-KMC	016 840 7190 4	CHASSIS ASS'Y
61 (XL)	SGPLPJ20-KXL	016 840 7188 8	CHASSIS ASS'Y
63	SKL293	016 828 0269 8	RUBBER
65 Ⓢ	SGXD150MA0A	016 846 3535 5	ORNAMENT PLATE
65 Ⓚ	SGXD150ZC0A	016 846 3536 4	ORNAMENT PLATE
66 Ⓢ	SBCD370SW0A	016 702 6756 3	BUTTON
66 Ⓚ	SBCD370ZC0A	016 702 6752 7	BUTTON
68 EXCEPT (M, MC)	SJJ130-1	003 400 6828 8	JACK
69 EXCEPT (M, MC)	SJJ130-2	003 400 7317 2	JACK
SCREWS, WASHERS AND NUTS			
N1	SNSD10	005 500 5675 8	SCREW
N2	XTN2+4G	005 501 2780 5	SCREW
N3	XQN17+A6	005 500 4900 2	SCREW
N4	SHDD1-1	016 634 0123 3	SCREW
N5	XTW3+8T	005 501 1358 9	SCREW
N6	XXE26D5	005 500 5095 2	SCREW
N7	SNSD9	016 726 0765 4	SCREW
N8	XSN26+6	005 500 1364 6	SCREW
N9	SFXW120-01	005 513 0957 0	WASHER
N10	XSN26+8	005 500 1368 2	SCREW
N11	XTN2+5G	005 501 3534 3	SCREW
N12 Ⓢ	SRXG007N10	005 500 5434 3	SCREW
N12 Ⓚ	SRXG007N51	005 500 5012 1	SCREW
N13	XTV3+8JFN	005 501 1326 7	SCREW
N14	XTV3+6G	005 501 0896 2	SCREW
N15	SFXGQ06N01	005 500 4983 3	SCREW
N16	XTV3+8JFZ	005 501 0919 2	SCREW
N18	XTV3+14G	005 501 0851 5	SCREW

■ EXPLODED VIEW

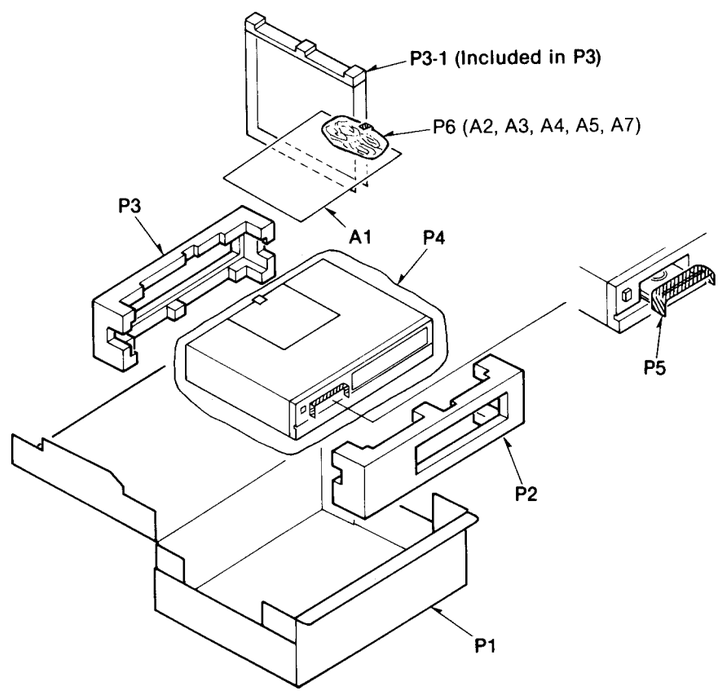


■ REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Code	Description
CONNECTORS			
71	EMCS0350Z	003 402 1227 7	CONNECTOR (CN103)
72	EMCS0550Z	003 402 1233 9	CONNECTOR (CN402)
73	EMCS0650Z	003 402 1235 7	CONNECTOR (CN11)
74	EMCS0750Z	003 402 1238 4	CONNECTOR (CN401)
75	EMCS0552M	003 402 0112 1	CONNECTOR (CN102)
76	SJSD1709		CONNECTOR (CN101)
77	SRDJ001N14E	003 410 6157 8	SHORTING PIN (CN102)

Ref. No.	Part No.	Part Code	Description
PACKINGS			
P1 (OTHERS) Ⓚ	SPND106	016 971 4728 4	CARTON BOX
P1 (EF) Ⓚ	SPND107	016 971 4727 5	CARTON BOX
P1 (OTHERS) Ⓢ	SPND108	016 971 4726 6	CARTON BOX
P1 (EF) Ⓢ	SPND109	016 971 4724 8	CARTON BOX
P1 (MC) Ⓚ	SPND110	016 971 4723 9	CARTON BOX
P2	SPSD65	016 977 3118 8	PAD
P3	SPSD66	016 977 3117 9	PAD
P4	XZB45X40A01	016 978 0470 2	POLYETHYLENE BAG
P5	SPSD68	016 977 3081 4	SHEET
P6	XZB23X20C03	016 978 0480 0	POLYETHYLENE BAG
ACCESSORIES			
A1 (M)	SQUD141	016 983 4827 6	INSTRUCTION BOOK
A1 (OTHERS)	SQUD143	016 983 4826 7	INSTRUCTION BOOK
A1 (EK)	SQUD144	016 983 4825 8	INSTRUCTION BOOK
A1 (EI)	SQUD145	016 983 4824 9	INSTRUCTION BOOK
A1 (E)(EB)(EH)	SQULPJ20-KE	016 983 4821 2	INSTRUCTION BOOK
A1 (MC)	SQULPJ20-KMC	016 983 4822 1	INSTRUCTION BOOK
A1 (XB)	SQULPJ20-KXB	016 983 4858 9	INSTRUCTION BOOK
A2 ⚠ (EK)	SFDAC05G02	003 490 2613 3	POWER CORD
A2 ⚠ (MC)	SJA170	003 490 4064 2	POWER CORD
A2 ⚠ (M)	SJA170-1	003 490 5022 8	POWER CORD
A2 ⚠ (OTHERS)	SJA171	003 490 4160 3	POWER CORD
A2 ⚠ (XL)	SJA173	003 490 4161 2	POWER CORD
A2 ⚠ (XB)	SJA183	003 490 4873 7	POWER CORD
A3	SJP2249-1	003 492 6446 4	OUTPUT CORD
A4 ⚠ (XA)ONLY	SFDKI19118	003 402 0523 6	PLUG
A5	SJP2257	003 492 4915 4	SYNC. CORD
A7 ⚠ (XB) ONLY	RJP120ZBS-H	003 402 1437 9	PLUG

■ PACKING



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Ref. No.	Part No.	Part Code	Description
INTEGRATED CIRCUITS			
IC13	SVIM5236L	001 060 5358 9	INTEGRATED CIRCUIT
IC101	AN8370S	001 060 8399 8	INTEGRATED CIRCUIT
IC102	MN6636S	001 061 3044 7	INTEGRATED CIRCUIT
IC103, IC104	AN6554NS	001 060 4860 4	INTEGRATED CIRCUIT
IC301	MN6617	001 060 8411 9	INTEGRATED CIRCUIT
IC302	MN6618A	001 061 3043 8	INTEGRATED CIRCUIT
IC303	MN4416S	001 061 3040 1	INTEGRATED CIRCUIT
IC304	EHDGA1243	001 061 3096 7	INTEGRATED CIRCUIT
IC401	MN15261PDU	001 061 3086 7	INTEGRATED CIRCUIT
IC402	AN6552F	001 060 0274 2	INTEGRATED CIRCUIT
IC403	MN1280-R	001 060 8669 5	INTEGRATED CIRCUIT
IC404 EXCEPT (M,MC)	MN1550PDT		INTEGRATED CIRCUIT
IC501	AN8290S	001 061 3034 9	INTEGRATED CIRCUIT
IC801	SVIPCM54HP-1	001 061 3098 3	INTEGRATED CIRCUIT
IC802	MN6636S	001 061 3044 7	INTEGRATED CIRCUIT
IC803	AN8376S	001 061 3035 8	INTEGRATED CIRCUIT
IC804, IC805	SVIGA011	001 061 3045 6	INTEGRATED CIRCUIT
IC806	MN1280-S	001 061 3084 9	INTEGRATED CIRCUIT
TRANSISTORS			
Q11	2SD1227M-Q		TRANSISTOR
Q12, Q13	2SB793A	001 030 2370 3	TRANSISTOR
Q14	2SB793A	001 030 2370 3	TRANSISTOR
Q15	2SD973A	001 030 1947 8	TRANSISTOR
Q16	2SB793A	001 030 2370 3	TRANSISTOR
Q17	2SB642	001 030 0694 4	TRANSISTOR
Q101	2SD637	001 030 1794 7	TRANSISTOR
Q141	2SD973A	001 030 1947 8	TRANSISTOR
Q142	2SB793A	001 030 2370 3	TRANSISTOR
Q161	2SD973A	001 030 1947 8	TRANSISTOR
Q162	2SB793A	001 030 2370 3	TRANSISTOR
Q181	2SD973A	001 030 1947 8	TRANSISTOR
Q182	2SB793A	001 030 2370 3	TRANSISTOR
Q402	2SD973A	001 030 1947 8	TRANSISTOR
Q403	2SB793A	001 030 2370 3	TRANSISTOR
Q405, Q406 EXCEPT (M,MC)	UN4212	001 030 3019 1	TRANSISTOR
Q408 EXCEPT (M,MC)	SVTDTA124EST	001 030 6078 8	TRANSISTOR
Q409 EXCEPT (M,MC)	UN4212	001 030 3019 1	TRANSISTOR
Q801	UN4212	001 030 3019 1	TRANSISTOR
Q802	UN4113	001 030 2900 9	TRANSISTOR
Q803	2SC3311-Q	001 030 2936 7	TRANSISTOR
DIODES			
D11, D12	MA4091-M	001 032 7213 5	DIODE
D15, D16	MA4068	001 032 5830 4	DIODE
D17	MA4330L	001 032 7228 8	DIODE
D18	MA4056-M	001 032 7209 1	DIODE
D19, D20 ⚠	SVDMPG06G	001 032 9230 6	RECTIFIER
D21, D22 ⚠	SVDMPG06G	001 032 9230 6	RECTIFIER
D23, D24 ⚠	SVDMPG06G	001 032 9230 6	RECTIFIER
D25, D26 ⚠	SVDMPG06G	001 032 9230 6	RECTIFIER
D181, D182	MA165	001 032 0494 0	DIODE
D401, D402	MA165	001 032 0494 0	DIODE
D403, D404	MA165	001 032 0494 0	DIODE
D406	MA165	001 032 0494 0	DIODE
D407 EXCEPT (M,MC)	MA165	001 032 0494 0	DIODE
D408, D409	MA165	001 032 0494 0	DIODE
D410, D411	MA165	001 032 0494 0	DIODE
D412, D413	MA165	001 032 0494 0	DIODE
D415, D416 EXCEPT (M,MC)	MA165	001 032 0494 0	DIODE
D417, D418 EXCEPT (M,MC)	MA165	001 032 0494 0	DIODE
D421, D422 EXCEPT (M,MC)	MA165	001 032 0494 0	DIODE
D501	MA153	001 032 0489 7	DIODE
D801, D802	MA165	001 032 0494 0	DIODE
I.C.PROTECTORS			
FP11 ⚠ (EK) ONLY	SRUDPF06F6	016 712 0339 4	IC PROTECTOR
FP12 ⚠ (EK) ONLY	SRUDPT08F6	016 712 0338 5	IC PROTECTOR
IC1, IC2 ⚠ (EK) ONLY	SVIFU38		IC PROTECTOR
IC11, IC12 ⚠	SVIFU15	001 060 8433 3	IC PROTECTOR
IC105 ⚠ (EK) ONLY	SVIICPN10		IC PROTECTOR
HALL ELEMENTS			
H501, H502	0H-001	001 036 0010 2	HALL ELEMENT
VARIABLE RESISTORS			
VR101	EVND3AA00B53	001 180 2644 9	VARIABLE RESISTOR
VR102, VR103	EVND3AA00B14	001 180 2642 1	VARIABLE RESISTOR
VR104, VR105	EVND3AA00B14	001 180 2642 1	VARIABLE RESISTOR
VR106	EVND3AA00B53	001 180 2644 9	VARIABLE RESISTOR
VR301	EVN38CA00B13	001 180 0549 5	VARIABLE RESISTOR
COILS AND TRANSFOMERS			
L501	NL4532T100K2	001 211 3218 9	COIL
T1 ⚠ (M,MC)	SLTD5K022SC	001 202 8429 1	POWER TRANSFORMER
T1 ⚠ (OTHERS)	SLTD5K023SE	001 202 8430 8	POWER TRANSFORMER
T1 ⚠ (EK, XL)	SLTD5K024SG	001 202 8431 7	POWER TRANSFORMER
T1 ⚠ (XA, XB)	SLTD5K025SX	001 202 8432 6	POWER TRANSFORMER
COMPONENT COMBINATIONS			
C2 ⚠	RXAF103Z22EY	001 230 0547 0	0.01μF X 2
OSCILLATORS			
X301	SVQ16CKSS	001 250 1471 7	16.9344MHZ
DISPLAYS			
FL401	SADD3-1		DISPLAY
FUSES			
F1 ⚠ EXCEPT (M)(MC)	XBA2C012TB0	002 380 1370 8	250V, T125mA
F2 ⚠ (XA)(XB)ONLY	XBA2C025TB0	002 380 1458 1	250V, T250mA
SWITCHES			
S1 ⚠	ESB8249V	003 435 5877 0	SWITCH, POWER
S2 ⚠ (XA, XB) ONLY	SRDSHXW0251	003 438 1067 7	SWITCH, VOLTAGE SELECTOR
S101	SSPD5	003 434 1032 8	SWITCH, REST
S401~S408	SSGD1-1	003 437 0799 7	SWITCH, OPERATION
RELAYS			
RL801	SSYD2	003 450 2734 9	RELAY, MUTING

■ TERMINAL FUNCTION OF LSI

• MN15261PDU (System Control and FL Drive)

Pin No.	Mark	Signal	I/O Devision	Function
1	VSS	GND	I	GND terminal
2	X0	——	O	Not used (Open)
3	X1	SENSE	I	Optical servo condition input
4	P00	PC	O	Spindle motor control signal (ON·OFF command)
5	P01	M DATA	O	Command data output
6	P02	MCLK	O	Command clock output
7	P03	MLD	O	Command load output
8	P10	M-RLY	O	Muting relay control
9	P11	D-DAT	O	Data output
10	P12	$\overline{\text{SYNC}}$	O	Synchro recording control (Not used)
11	P13	$\overline{\text{D-OP}}$	O	Direct operation control (Not used)
12	$\overline{\text{SYNC}}$	——	O	Not used (Open)
13	$\overline{\text{RST}}$	RESET	I	Reset signal input (reset at "L")
14	$\overline{\text{IRQ}}$	BLKCK	I	Sub-code block (Q data) clock (75Hz) input
15 ⌇ 18	P50 ⌇ P53	——	I	Key scan input
19	$\overline{\text{SBT}}$	$\overline{\text{CLDCK}}$	I	Sub-code frame clock (7.35kHz)
20	$\overline{\text{SBD}}$	SUBQ	I	Sub-code Q data input
21	P20	TGC	O	———
22	P21	$\overline{\text{TRV-H}}$	O	Traverse servo control signal
23	P22	$\overline{\text{TRV-R}}$	O	Traverse reverse command signal
24	P23	$\overline{\text{RRV-F}}$	O	Traverse forward command signal
25	P30	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [Reverse] command)
26	P31	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [Forward] command)
27	P32	CNT2	O	Optical servo IC control signal (TRON: Tracking servo)
28	P33	CNT1	O	Optical servo IC control signal (FOON: Focus servo)
29	P40	START	I	Key input strobe and processing status input from signal processing LSI traverse position detection.
30	P41	$\overline{\text{D END}}$	O	Data (end signal) signal
31	P42	$\overline{\text{FLOCK}}$	I	Optical servo condition (focus) input
32	P43	$\overline{\text{SENSE}}$	I	Optical servo condition (track cross) input
33	PE0	$\overline{\text{CLOSE}}$	O	Loading motor close command (ON at "L")
34	PE1	$\overline{\text{OPEN}}$	O	Loading motor open command (ON at "L")
35	P60	$\overline{\text{CLK}}$	O	Clock signal output
36	P61	D-STA	O	Data start signal
37	DAC	DAC	O	———
38	VPP	——	I	FL drive power supply (connected to −32V)
39 ⌇ 52	D0 ⌇ DD	——	O	FL grid signal and key scan signal
53 ⌇ 61	S8 ⌇ S0	——	O	FL anode signal
62	OSC2	——	I	Clock terminal
63	OSC1	——	I	Clock input
64	VDD	——	I	Power supply (connected to +5V)

• MN1550PDT (Remote Control Signal Processing)

Pin No.	Mark	Signal	I/O Devision	Function
1	VDD	——	I	Power supply (connected to +5V)
2	OSC	SMCK	I	Clock input
3	P23	——	——	———
4	P22	——	——	———
5	RST	RESET	I	Reset signal input
6	P21	——	——	———
7	P20	——	I	Remote control signal input
8	IRQ	——	I	Program enable/de-enable control
9	SYNC	——	O	Clock output
10 ⌇ 13	P10 ⌇ P13	Data	I	Key strobe
14 ⌇ 17	P00 ⌇ P03	Data	I	Key strobe
18	VSS	GND	I	GND terminal

• MN6617 (Digital Signal Processing : EFM Decoder, Error Correction, CLV Servo)

Pin No.	Mark	I/O Devision	Function
1	BLKCK	O	Sub-code block (Q data) clock (75 Hz)
2	$\overline{\text{CLDCK}}$	O	Sub-code frame (Q data) clock (7.35 kHz)
3	$\overline{\text{SUBQ}}$	O	Sub-code (Q data) output
4	CRC	O	Sub-code (Q data) CRC check (Not used, open)
5	$\overline{\text{RST}}$	I	Reset signal input (reset at "L")
6	MLD	I	Command load input
7	MCLK	I	Command clock input
8	MDATA	I	Command data input
9	DMUTE	I	Muting control (muting ON at "H")
10	$\overline{\text{TRON}}$	I	Tracking servo ON signal (tracking servo ON at "L")
11	STAT	O	Processing condition (CRC, OTC, CLVOK, TT STOP) output
12	SMCK	O	Clock output (4.2336 MHz)
13	PMCK	O	Pitch control clock output (Not used, open)
14	ITC	I	Track counter input signal (Not used, connected to +5V)
15	$\overline{\text{TEST}}$	I	Test mode selection (Not used, connected to +5V)
16	X2	O	Clock output (16.9344 MHz)
17	X1	I	Clock input (16.9344 MHz)
18	SEL	I	DA output parallel/serial selection (serial at "L")
19	LDG/WDCK	O	L channel deglitch signal/serial data word clock.
20	RDG	O	R channel deglitch signal.
21	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")
22	IPFLAG	O	Interpolation flag (interpolation at "H")
23	FLAG0	O	Error flag (error at "H")
24	FLAG6	O	16 K RAM address reset signal (reset at "H")
25	XCK	O	Clock (16.9344 MHz) output (Not used, open)
26	DA15/ SRDATA	O	16-bit data output/serial data output (MSB first)
27	DA14/ SRDATAX	O	16-bit data output/serial data output (LSB first)
28	DA13/SRCK	O	16-bit data output/serial data beat clock.
29	DA12/WDCK	O	16-bit data output/serial data word clock (Not used)
30	DA11/ BYTCK	O	16-bit data output/serial data byte clock (Not used)
31	GND	I	GND terminal
32	DA10/RIL	O	16-bit data output/RIL signal
33	DA9/RESY	O	16-bit data output/ Resynchronizing signal
34	DA8/FCLV	O	16-bit data output/Synchronizing detection signal (Not used)
35	DA7/ IPBYTE	O	16-bit data output/Interpolation flag for each byte (Not used)
36	DA6/IPSEL	I/O	16-bit data output/ interpolation inhibit (Not used)
37	DA5/FLAG5	O	16-bit data output/C2 decoder correction flag 3 (Not used)
38	DA4/FLAG4	O	16-bit data output/C2 decoder correction flag 2 (Not used)
39	DA3/FLAG3	O	16-bit data output/C2 decoder correction flag 1 (Not used)
40	DA2/FLAG2	O	16-bit data output/C1 decoder correction flag 2 (Not used)
41	DA1/FLAG1	O	16-bit data output/C1 decoder correction flag 1 (Not used)
42	DA0/FLCK0	O	16-bit data output/Crystal frame clock
43 ⌇ 50	D7 ⌇ D0	I/O	16 K RAM data output
51	RAMOE	O	16 K RAM $\overline{\text{OE}}$ signal
52	RAMWE	O	16 K RAM $\overline{\text{WE}}$ signal
53 ⌇ 63	RAMA 0 ⌇ RAMA10	O	16 K RAM address signal (RAMA0 : LSB, RAMA10: MSB)
64	PC	O	Spindle motor ON signal (ON at "L")
65	EC	O	Spindle motor drive signal
66	FG	I	Spindle motor FG signal input
67	——	——	———
68	——	——	———
69	——	——	———
70	——	——	———
71	——	——	———
72	PCK	I	PLL extract clock input
73	VDD	I	Power supply (connected to +5V)
74	EFM	I	EFM signal input (PLL)
75	SRF	I	EFM signal input (DSL)
76	DO	I	Drop-out signal (Drop-out at "H")
77	CLVS	O	11T servo OK signal (OK at "H")
78	FPC	O	PLL frequency comparision signal
79	BSSEL	O	PLL frequency in take operation signal.
80	——	——	———
81	——	——	———
82	——	——	———
83	SUBC	O	Sub-code serial output data
84	SBCK	I	Clock for sub-code serial output

• AN8370S (Optical Servo Control)

Pin No.	Mark	I/O Devision	Function
1	VEE	I	Power supply (connected to −5V)
2	LSA	I	Phase difference input (A)
3	GND	I	GND terminal
4	LSB	I	Phase difference input (B)
5	APC	O	Auto laser power control output
6	TEOUT	O	Tracking error signal output
7	TEG	I	Tracking error gain adjusting input
8	TE−	I	Phase difference-voltage conversion (−)
9	TE +	I	Phase difference-voltage conversion (+)
10	APC −	O	Laser power inversion input
11	C·MEM	I	Capacitor connection for phase difference memory
12	APC +	I	Laser power non-inversion input
13	VREF	O	Reference current generation
14	SENSE	O	Selector output (track-crossed)
15	HIN	I	Tracking hold circuit input
16	HOUT	O	Tracking hold circuit output
17	SPCNT	O	Track-cross speed control output (not used, grounded)
18	C·MSP	I	Track-cross reference speed setting capacitor connection (not used, grounded)
19	C·AF	I	Auto focus timer capacitor connection
20	KICK R/$\overline{F}$	O	Track kick signal output
21	VCC	I	Power supply (connected to +5V)
22	CNT1	I	Control input ($\overline{FOON}$: Focus servo ON signal)
23	CNT2	I	Control input ($\overline{TRON}$: Tracking servo ON signal)
24	CNT3	I	Control input (KICKF : Kick direction [forward] command)
25	CNT4	I	Control input (KICKR : Kick direction [reverse] command)
26	$\overline{F\cdot LOCK}$	O	Focus lock signal output
27	C·FBDO	O	Capacitor connection for inversion RF high speed detection
28	C·SBDO	O	Capacitor connection for inversion RF low speed detection
29	C·SBRT	O	Capacitor connection for non-inversion RF low speed detection
30	C·FBRT	O	Capacitor connection for non-inversion RF high speed detection
31	RF OUT	O	RF signal output
32	BDO	O	Drop-out detection output
33	RFIN	I	RF signal input
34	S·OUT	O	Focus search signal output
35	C·LW	I	Capacitor connection for triangular wave generation
36	FE·OUT	O	Focus error signal output
37	FEG	I	Focus error gain adjusting input
38	FE·REF	I	Focus error comparison voltage generation
39	PDB	I	Photo detector current input (B)
40	IVB	O	Current/voltage conversion output (B)
41	IVA	O	Current/voltage conversion output (A)
42	PDA	I	Photo detector current input (A)

• EHDGA1243 (Data Slice and PLL)

Pin No.	Mark	I/O Devision	Function
1	PCK	O	Clock output extracted from SRF
2	EFM	O	EFM signal output synchronized with PCK
3	D·GND	I	GND terminal (digital system)
4	SRF	O	RF signal output data-sliced into digital value
5	SLC	I	Slice level control signal input
6	DO	O	Drop-out detection pulse output
7	FPC	I	Frequency comparison error signal input.
8	VCC	I	Power supply (connected to +5V)
9	NC	——	Non connection
10	VR	I	Resistor connection for VCO oscillation frequency
11	VEE	I	Power supply (connected to −5V)
12	VC1	I	Capacitor connection for VCO oscillator frequency
13	VC2	I	Capacitor connection for VCO oscillator frequency
14	A·GND	I	GND terminal (analog system)
15	RF	I	RF signal input

• MN6618 (Digital Filter)

Pin No.	Mark	I/O Device	Function
1	———	——	———
2	D012	O	16-bit parallel data output
3	D011/SCK	O	16-bit parallel data output/ serial output bit clock
4	D010/SOUT	O	16-bit parallel data output/ serial output data
5	GND	I	GND terminal
6	D09	O	16-bit parallel data
7	———	——	———
8	D08	O	16-bit parallel data
9	D07	O	16-bit parallel data
10	———	——	———
11	———	——	———
12	D06	O	16-bit parallel data
13	D05	O	16-bit parallel data
14	D04	O	16-bit parallel data
15	D03/2RLCK	O	16-bit parallel data/RL signal
16	———	——	———
17	———	——	———
18	D02/WCK	O	16-bit parallel data/serial output word clock
19	D01	O	16-bit parallel data
20	D00	O	16-bit parallel data (LSB)
21	MDATA	I	Command data input
22	———	——	———
23	MCLK	I	Command clock input
24	MLD	I	Command load input
25	———	——	———
26	$\overline{RST}$	I	Reset signal input (reset at "L")
27	VDD	I	Power supply (connected to +5V)
28	LRCK	I	R/L signal
29	———	——	———
30	SFT	I	Serial data input clock
31	SIN	I	Serial data input
32	———	——	———
33	X OUT	O	Clock output (Not used)
34	X IN	I	Clock input (16.9344 MHz)
35	OSEL	I	DA output parallel/serial selection. (parallel at "H")
36	LDGL	O	L channel deglitch signal
37	RDGL	O	R channel deglitch signal
38	VDD	I	Power supply (connected to +5V)
39	D015	O	16-bit parallel data (MSB)
40	D014	O	16-bit parallel data
41	———	——	———
42	D013	O	16-bit parallel data

• AN8290S (Spindle Motor Drive)

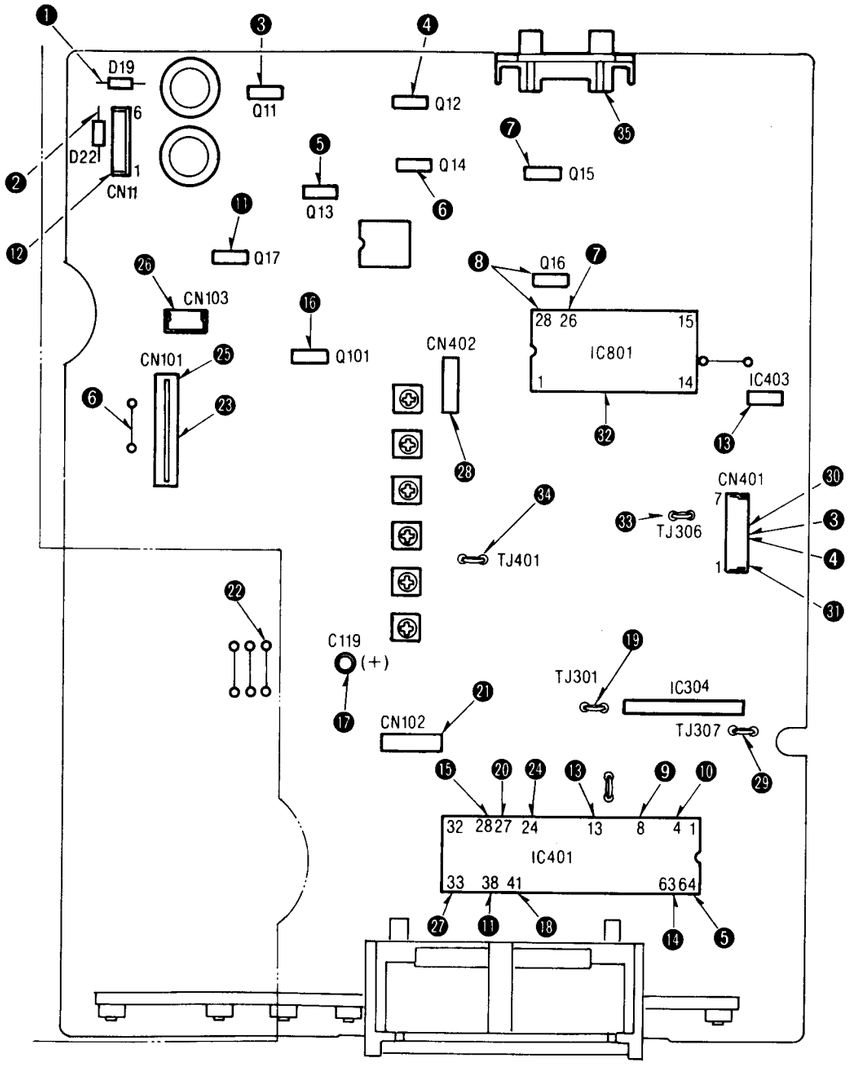
Pin No.	Mark	I/O Devision	Function
1	GND	I	Minimum potential of IC control. (In this unit, it is connected to VEE [−8.5V])
2	DCR	I	Standard voltage of FAI, PC, CLK. (In this unit, it is connected to 2.5V.)
3	FAI	I	Torque command filter amp. input. (Normal rotation command when FAI < DCR.)
4	FAO	O	Filter amp. output.
5	DI	I	Absolute value circuit input.
6	LPF	I	Capacitor terminal for low pass filter of current feedback loop.
7	A1	O	Drive signal output.
8	A2	O	
9	A3	O	
10	PGND	I	Minimum potential of IC power. (In this unit, it is connected to VEE [−8.5V])
11	CS	I	Drive current detection resistor terminal.
12	PVCC	I	Power input for IC power.
13	H3−	I	Not used in this unit.
14	H3+	I	
15	H2−	I	Negative output of Hall element is input.
16	H2+	I	Positive output of Hall element is input.
17	H1−	I	Negative output of Hall element is input.
18	H1+	I	Positive output of Hall element is input.
19	HSW	I	Bias switch of Hall element. (OFF when PC > DCR)
20	HB	I	Bias power of Hall element.
21	VCC	I	Power input for IC control.
22	PC	I	Power control. (Power down mode when PC > DCR)
23	CLK	I	Clock input. (DCR standard, operated at the edge of rise.)
24	TC	I	Triangular wave generation capacitor terminal.

■ TROUBLESHOOTING

Notes:

1. Carefully handle the compact disc because stains, dust or warping may cause generation of noise.
2. For the voltage value and waveform, refer to the schematic diagram. (The voltage value and waveform slightly varies depending on the measuring set and tester.)
3. Possible defects are mainly shown by the name of semi-conductor. The adjacent electronic circuits (such as C and R) are omitted.

• Check points



• Check the power supply circuit

Check point ❶

Check the voltage of terminal D19 (cathode).....8.9V — NO → AC cord, S1, T1, D19, 20 } defective

YES ↓

Check point ❷ Check the voltage of terminal D22 (anode).....⊖9.3V — NO → D21, D22 } defective

YES ↓

Check point ❸ Check the voltage of terminal Q11 (emitter) or CN401, pin 4.....8.5V — NO → IC11, Q11, D11 } defective

YES ↓

Check point ❹ Check the voltage of terminal Q12 (emitter) or CN401, pin 3.....⊖8.5V — NO → IC12, Q12, D12 } defective

YES ↓

Check point ❺ Check the voltage of terminal Q13 (collector) or IC401, pin 64.....5V — NO → IC13, Q13 } defective

YES ↓

Check point ❻ Check the voltage of terminal Q14 (emitter) or jumer wire.....⊖5V — NO → IC402, Q14 } defective

YES ↓

Check point ❼ Check the voltage of terminal Q15 (emitter) or IC801, pin 26.....6.5V — NO → Q15, D15 } defective

YES ↓

Check point ❽ Check the voltage of terminal Q16 (emitter) or IC801, pin 28.....⊖6.5V — NO → Q16, D16 } defective

YES ↓

Check point ❾ Check the voltage of IC401, pin 8.....12.5V — NO → D23, D24 } defective

YES ↓

Check point ❿ Check the voltage of IC401, pin 4.....⊖12V — NO → D24, D25 } defective

YES ↓

Check point ⓫ Check the voltage of terminal Q17 (emitter) or IC401, pin 38.....⊖32V — NO → D18, D25, D26, Q17 } defective

YES ↓

Check point ⓬ Check the voltage of CN11 ①, ②..... AC 2.3V — NO → T1, D18 } defective

• Check the focus servo

Check the power supply circuit

Check point ⓭ YES ↓ Reset signal is "H (4.2V)"? (IC403, pin 1 or IC401, pin 13) — NO → IC402

Check point ⓮ YES ↓ Clock is oscillating (4.2336MHz)? (IC401, pin 63) — NO → IC301, X3, R407, C4

Check point ⓯ YES ↓ Focus ON signal level is "L (0V)"? (IC401, pin 28) — NO → IC401, IC101

Check point ⓰ YES ↓ Laser A.P.C. signal is ON? (Q101 collector) — NO → IC101, Q101

Check point ⓱ YES ↓ Focus search signal is emitted? (IC101, pin 35 or C119) — NO → IC101

Check point ⓲ YES ↓ Focus OK signal is "L (0V)"? (IC401, pin 31) — NO → IC101, IC401

YES ↓ Focus lens moves up and down for a few seconds? (Not needed to set the disc) — NO → IC104, Q141, 142, Pickup

Check point ⓳ YES ↓ RF signal is emitted? (Test pin TJ301) — NO → IC101, Pickup

• Check the tracking servo

Check point ⓴ Check the TR ON signal (IC401 27 pin). "L" in play and "H" in search/skip. — NO → IC101, IC401

Check point ㉑ YES ↓ Tracking error signal is emitted? (CN102, pin 1 or pin 2) — NO → IC101

Check point ㉒ YES ↓ Track jump pulse is emitted during search/skip? (IC101, pin 20 or jumper wire) — NO → IC101

Check point ㉓ YES ↓ Tracking coil drive signal is emitted? (CN101, pin 8) — NO → IC104, Q161, Q162

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• Check the power supply circuit

Check point ❶

Check the voltage of terminal D19 (cathode).....8.9V — NO → AC cord S1, T1, D19, 20 } defective

Check point ❷ — YES

Check the voltage of terminal D22 (anode).....⊖9.3V — NO → D21 D22 } defective

Check point ❸ — YES

Check the voltage of terminal Q11 (emitter) or CN401, pin 4.....8.5V — NO → IC11 Q11 D11 } defective

Check point ❹ — YES

Check the voltage of terminal Q12 (emitter) or CN401, pin 3.....⊖8.5V — NO → IC12 Q12 D12 } defective

Check point ❺ — YES

Check the voltage of terminal Q13 (collector) or IC401, pin 64.....5V — NO → IC13 Q13 } defective

Check point ❻ — YES

Check the voltage of terminal Q14 (emitter) or jumer wire.....⊖5V — NO → IC402 Q14 } defective

Check point ❼ — YES

Check the voltage of terminal Q15 (emitter) or IC801, pin 26.....6.5V — NO → Q15 D15 } defective

Check point ❽ — YES

Check the voltage of terminal Q16 (emitter) or IC801, pin 28.....⊖6.5V — NO → Q16 D16 } defective

Check point ❾ — YES

Check the voltage of IC401, pin 8.....12.5V — NO → D23 D24 } defective

Check point ❿ — YES

Check the voltage of IC401, pin 4.....⊖12V — NO → D24 D25 } defective

Check point ⓫ — YES

Check the voltage of terminal Q17 (emitter) or IC401, pin 38.....⊖32V — NO → D18, D25 D26, Q17 } defective

Check point ⓬ — YES

Check the voltage of CN11 ①, ②.....AC 2.3V — NO → T1 D18 } defective

• Check the focus servo

Check the power supply circuit

Check point ⓭ — YES

Reset signal is "H (4.2V)"? (IC403, pin 1 or IC401, pin 13) — NO → IC402 defective

Check point ⓮ — YES

Clock is oscillating (4.2336MHz)? (IC401, pin 63) — NO → IC301, X301 R407, C403 } defective

Check point ⓯ — YES

Focus ON signal level is "L (0V)"? (IC401, pin 28) — NO → IC401 IC101 } defective

Check point ⓰ — YES

Laser A.P.C. signal is ON? (Q101 collector) — NO → IC101 Q101 } defective

Check point ⓱ — YES

Focus search signal is emitted? (IC101, pin 35 or C119) — NO → IC101 defective

Check point ⓲ — YES

Focus OK signal is "L (0V)"? (IC401, pin 31) — NO → IC101 IC401 } defective

YES

Focus lens moves up and down for a few seconds? (Not needed to set the disc) — NO → IC104 Q141, 142 Pickup } defective

Check point ⓳ — YES

RF signal is emitted? (Test pin TJ301) — NO → IC101 Pickup } defective

• Check the tracking servo

Check point ⓴

Check the TR ON signal (IC401 27 pin). "L" in play and "H" in search/skip. — NO → IC101 IC401 } defective

Check point ㉑ — YES

Tracking error signal is emitted? (CN102, pin 1 or pin 2) — NO → IC101 defective

Check point ㉒ — YES

Track jump pulse is emitted during search/skip? (IC101, pin 20 or jumper wire) — NO → IC101 defective

Check point ㉓ — YES

Tracking coil drive signal is emitted? (CN101, pin 8) — NO → IC104 Q161 Q162 } defective

• Check the traverse servo

Check point ㉔

Kick pulse is emitted in skip mode? (IC401, pins 23, 24) — NO → IC401 defective

Check point ㉕ — YES

Traverse coil drive signal is emitted? (CN101, pin 17) — NO → IC103 Q181 Q182 } defective

Check point ㉖ — YES

Speed sensor singnal is emitted? (CN103, pin 3) — NO → Speed sensor } defective

• Check the loading motor drive

Check point ㉗

Loading motor close/open command signal is emitted? (IC401, pins 33, 34) — NO → IC401 defective

Check point ㉘ — YES

Loading motor drive signal is emitted? (CN402, pin 5) — NO → IC402 Q402, 403 motor } defective

• Check the digital and audio

Check point ㉙

PCK signal is emitted? (Test pin TJ307) — NO → IC304 IC301 } defective

Check point ㉚ — YES

CLK signal is emitted? (CN401, pin 5) — NO → IC301 defective

Check point ㉛ — YES

Spindle motor ON command signal is "H (2.5V)"? (CN401, pin 1) — NO → IC301 defective

Check point ㉜ — YES

Data signal is emitted? (IC801, pins 2, 3, 5~18) — NO → IC301, 302 IC801 } defective

Check point ㉝ — YES

Deglitch signal is emitted? (Test pin TJ306) — NO → IC301 IC302 } defective

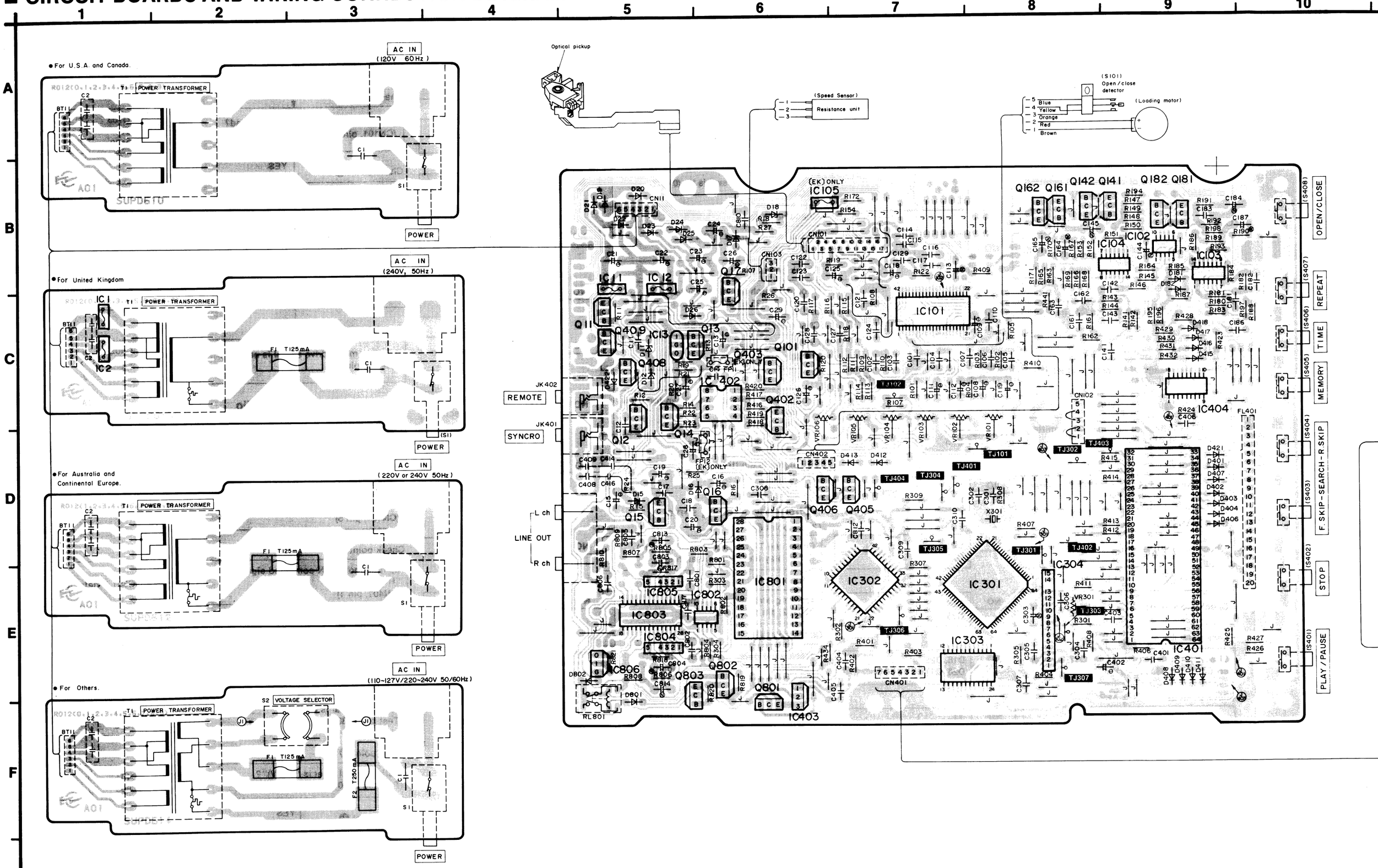
Check point ㉞ — YES

Muting signal level is "L (0V)"? (Test pin TJ401) — NO → IC401 IC803 } defective

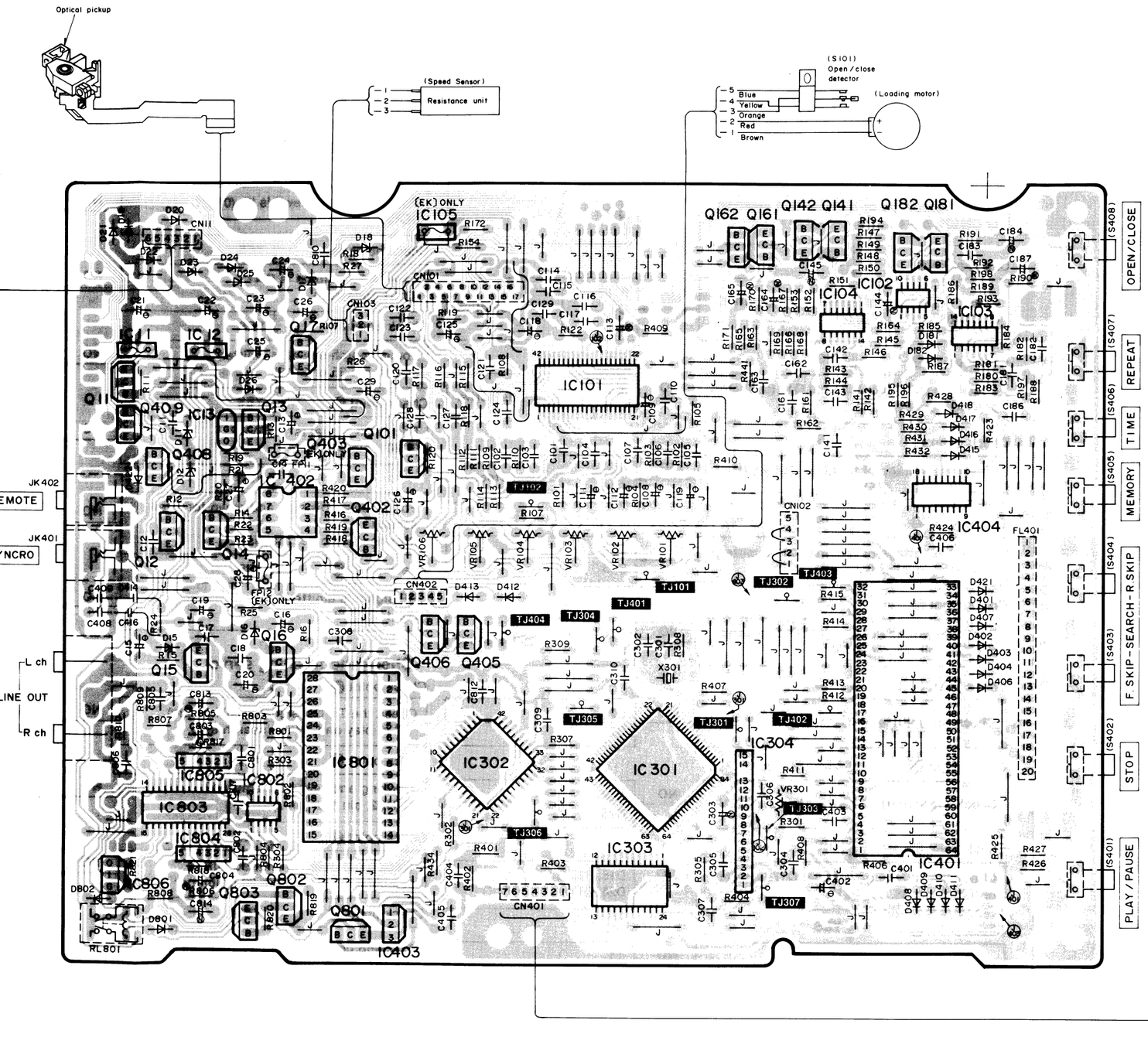
Check point ㉟ — YES

AF signal is emitted? (Output terminal) — NO → IC802~804 defective

■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM



5 6 7 8 9 10 11 12



■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Notes:

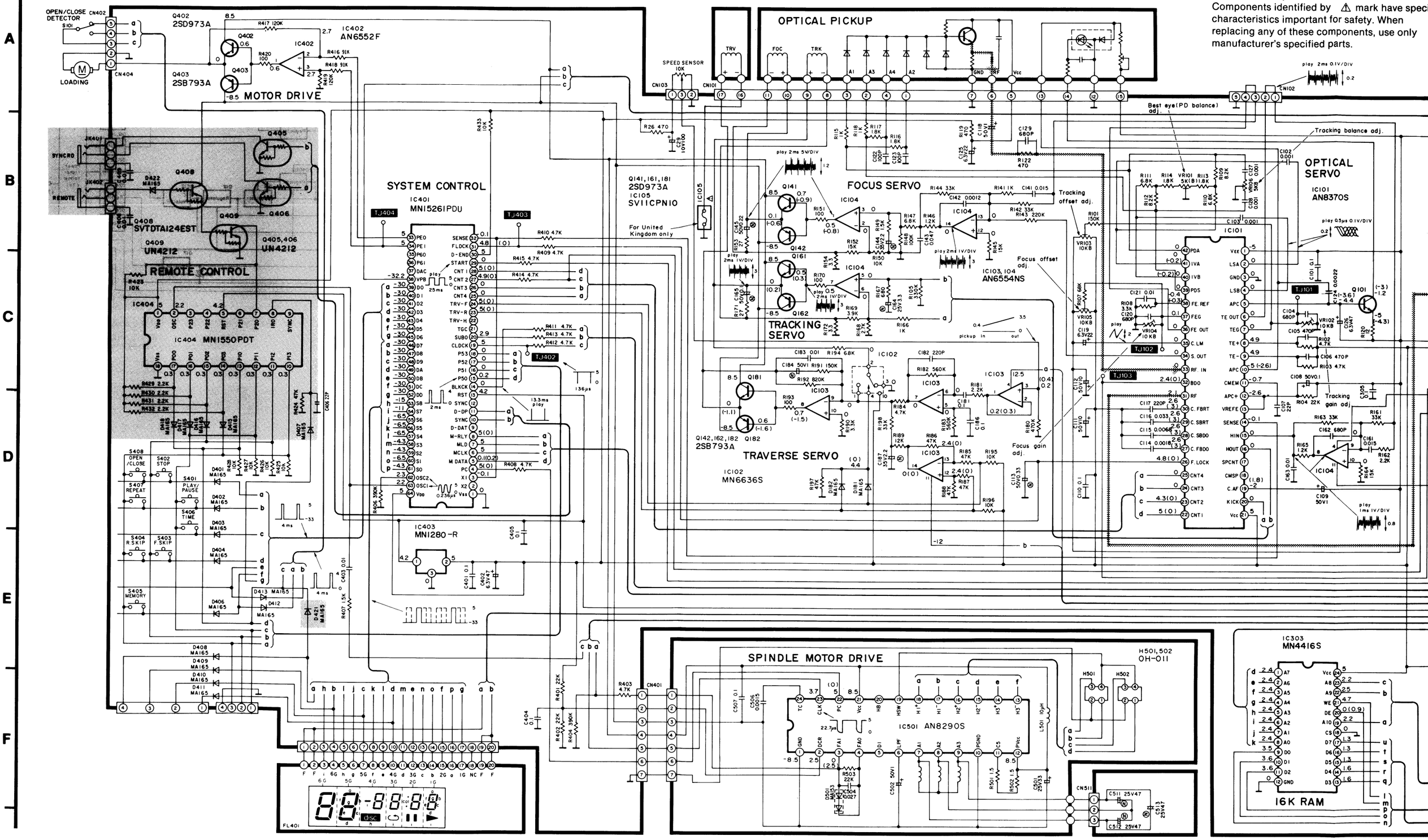
1. **S1** : Power switch is "**on**" position.
2. **S2** : Voltage selector switch. (For [XA] and [XB] areas)
3. **S101** : Disc holder open/close detection switch.
4. **S401** : Play/pause switch.
5. **S402** : Stop/clear switch.
6. **S403** : Forward skip/search switch.
7. **S404** : Backward skip/search swirch.
8. **S405** : Memory/recall switch.
9. **S406** : Time mode select switch.
10. **S407** : Repeat switch.
11. **S408** : Open/close switch.
12. The voltage value and waveform are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
    * The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.
13. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
14. ——— : Positive voltage lines and negative voltage lines.
    ⟿ : Audio signal lines.

● Caution!

IC and LSI are aensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.

Note:
The product for the U.S.A. and Canada is not provided with the circuitry in the shaded areas.



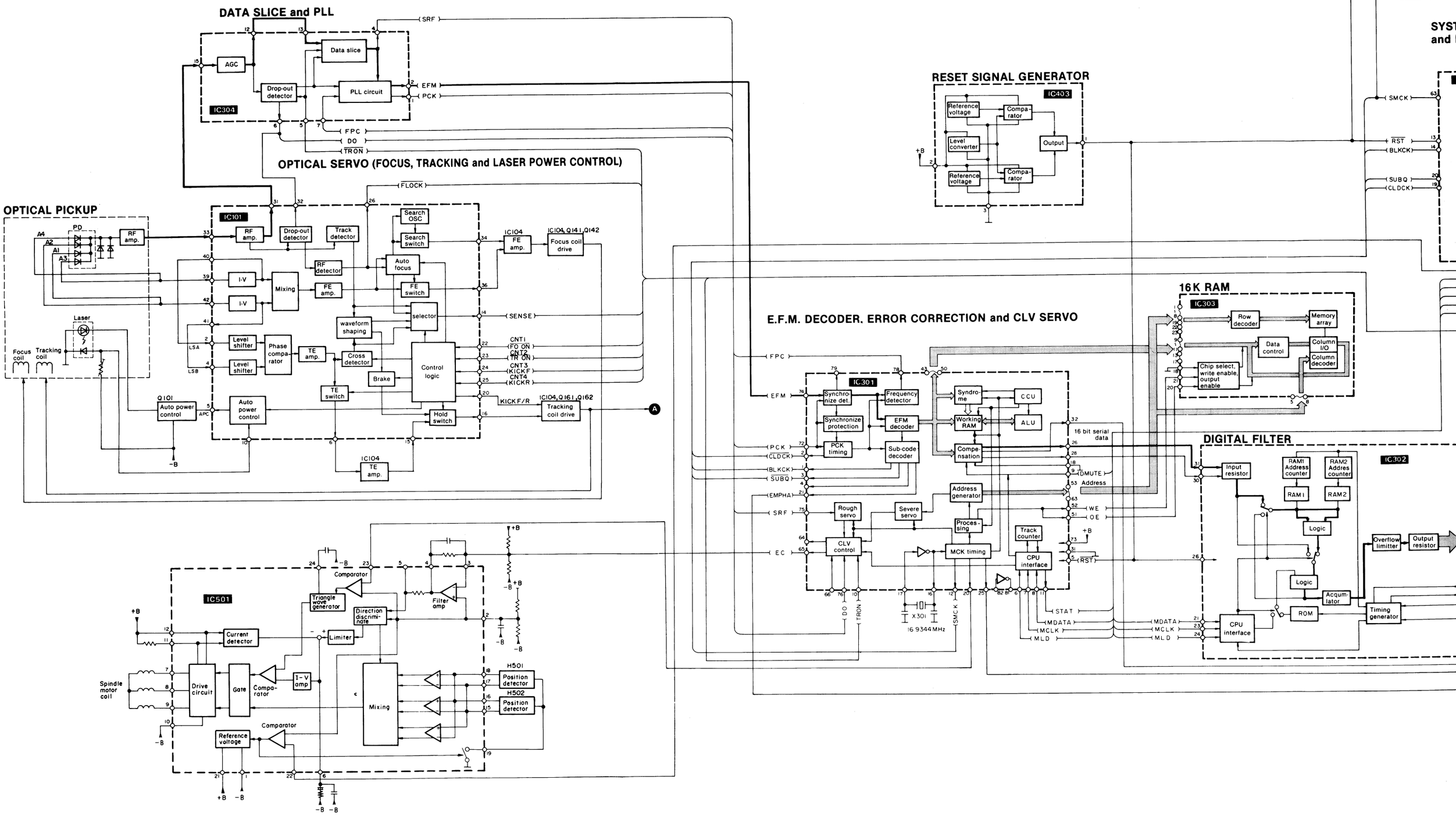
- Important safety notice:
  Components identified by ⚠ mark have specific characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

• Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

• ——— : Positive voltage lines and negative voltage lines.
⟿ : Audio signal lines.

OPTICAL SERVO
IC101 AN8370S
DATA SLICE AND PLL
IC304 EHDGA1243
DIGITAL SIGNAL PROCESSING
IC303 MN4416S
16K RAM
IC301 MN6617
IC302 MN6618A
DIGITAL FILTER
IC801 SVIPCM54HP-1
D/A CONVERTER
IC802 MN6636S DIGLITCH
IC803 AN8376S AUDIO
IC804 SVIGA011 FILTER
IC805 SVIGA011 FILTER
POWER SUPPLY
IC11,12 SVIFU15
IC1,2 SVIFU38
POWER SOURCE
Q15 2SD973A
Q16 2SB793A
Q17 2SB642
Q11 2SD1227M
Q12~14 2SB793A
Q101 2SD637
IC402 AN6552F
IC13 SVIM5236L
FP11 SRUDPF06F6
FP12 SRUDPT08F6
IC806 MN1280-S
Q802 UN4113
Q803 2SC3311
Q801 UN4212
For U.S.A. and Canada.
For United Kingdom only
For Continental Europe, United Kingdom and Australia.
For others
AC 120V (60Hz)
AC 220,240V (50/60Hz)
AC 110-127/220-240V (50/60Hz)
LINE OUT
L ch
R ch

■ BLOCK DIAGRAM



SYSTEM CONTROL and FL DRIVE

IC401
CLOCK GEN.
ROM 6144 x 8
IR
PC
HALT/ STOP
DISPLAY CONTROL
SP
X
Y
SX SY SE
320 x 4
BANK
SBT
SB
INT. FLAG
INT. EN FLAG
CF ZF
ALU
TC
TB
BC
SYSTEM CONTROL
E
A
DAC
LB
SMCK
RST
BLKCK
SUBQ
CLDCK
SI01 Open/close detector
KEY MATRIX
F L
FLOCK
SENSE
Q405,406 Synchro drive
CLOSE
OPEN
CNT4
CNT3
CNT2
CNT1
PC
MDATA
MCLK
MLD
D MUTE
STAT

REMOTE CONTROL DATA PROCESSING

IC404
CLOCK GEN.
ROM 1024 x 8
IR
PC (10)
HALT/ STOP
SP
Y (4)
X (4)
SX SY SE
96 x 4
SBT
SB
INT FLAG
INT. EN. FLAG
CF ZF
ALU
TC
TB
BC
SYSTEM CONTROL
E(4)
A(4)
LB
SMCK
RST
Q408,409 Remote drive

POWER SUPPLY

IC402 12.5V Q15 Regulator
IC801~803, D801 6.5V
IC501,Q141,Q601, Q181,Q402 8.5V
IC101~104, IC301 304, IC401, IC403 IC404, Q803, Pickup, 5V
IC13 Regulator
Q13 Regulator
Q11 Regulator
IC11 IC Protector
D23 Rectifier
D19,20 Rectifier
D21,22 Rectifier
D24 Rectifier
D26 Rectifier
IC402 Regulator
Q14 Regulator
Q12 Regulator
IC12 IC Protector
IC101,103,104,304 Q101, Pickup -5V
IC501,Q142,Q162, Q182,Q403 -8.5V
Q16 Regulator
IC801, 803 -6.5V
IC402 -12V
IC401 -32V
FL401 AC2.3V
Q17 Regulator
D18
Power transformer (T1)
(S1) AC IN

MOTOR DRIVE

IC402 Logic
Q402,403 Motor drive
Loading motor M

TRAVERSE SERVO

IC102
IC103 Traverse servo
Traverse coil drive
IC103,Q181,182
Traverse coil
IC103 Speed detector
+B

16K RAM

IC303
Row decoder
Memory array
Data control
Column I/O
Column decoder
Chip select, write enable, output enable

DIGITAL FILTER

IC302
Input resistor
RAM1 Address counter
RAM2 Addres counter
RAM1
RAM2
Logic
Logic
Overflow limitter
Output resistor
Acqum-lator
ROM
Timing generator
CPU interface

D/A CONVERTER

IC801
Ladder resistor network
I-V

IC802
IC802
IC803
IC804
IC805
Q801~803 Relay drive
Relay
L ch
R ch
LINE OUT

Printed in Japan
860809000 Ⓢ HS

ORDER NO. HAD8609713A4

Service Manual

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-PJ20

SL-PJ20

Color

(K) ..... Black Type
(S) ..... Silver Type

Color	Areas
(S) (K)	[PC].... European Audio club

Please use this manual together with the service manual for Model No. SL-PJ20, Order No. HAD8608682C0.

CHANGES

■ REPLACEMENT PARTS LIST

Note: 1. Mentioned in this parts list are only those parts different from Model SL-PJ20 for destination [XA] area.

2. Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Ref. No.	Change of Part No. [XA] ➡ [PC]		Part Name & Description	Per Set (Pcs.)	Remarks
CABINET AND CHASSIS					
61	SGPD60ZF1A	**SGPLPJ20-KPC**	CHASSIS ASS'Y	1	
ACCESSORIES					
A1	SQUD143	**SQULPJ20-KPC**	Instruction Book	1	
A2	SJA171	**SJA168-1**	AC Cord		⚠
A4	SFDKI19118	———	Plug	0	Deletion
A8	———	**SJP9215**	Adaptor	1	Addition

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Printed in Japan
860900500 Ⓢ HS

ORDER NO. HAD8611756P0

Parts Change Notice

Model No.		
	SL-PJ20	Order No. HAD8608682C0
	SL-PJ30	Order No. HAD8609721C0
	SL-P520	Order No. HAD8610738C0
	SL-P720	Order No. HAD8610737C0

Please revise the original parts list in the Service Manual to conform to the change (s) shown herein. If new part numbers are shown, be sure to use them when orderring parts.

Reason for Change *The circled item indicates the reason. If no marking, see the Notes in the bottom column.

1.	Improve performance
2.	Change of material or dimension
3.	To meet approved specification
4.	Standardization
5.	Addition
6.	Deletion
7.	Correction
8.	Other

Interchangeability Code **The circled item Indicates the interchangeability. If no marking, see the Notes in the bottom column.

	Parts		Set Production	
A	Original	→	Early	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
	New	→	Late	
B	Original	→	Early	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.
	New	→	Late	
C	Original	→	Early	New parts only may be used in early or late production sets. Stock new parts.
	New	→	Late	
D	Original	→	Early	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
	New	→	Late	
E	Other			

Part Number

Model No.	Ref. No.	Original Part No.	New Part No.	Notes (*'**)	Part Name & Descriptions
SL-PJ20	41	SOMA9A	SOMD9A	7, C	Rotor Ass'y
SL-PJ30	41	SOMA9A	SOMD9A	7, C	Rotor Ass'y
SL-P520	41	SOMA9A	SOMD9A	7, C	Rotor Ass'y
SL-P720	41	SOMA9A	SOMD9A	7, C	Rotor Ass'y

File this Parts Change Notice with your copy of the Service Manual.

Technics

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50 Meadowland Parkway,
Secaucus, New Jersey 07094

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Carolina, Puerto Rico 00630

Panasonic Hawaii, Inc.
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Minato-ku, Tokyo 105, Japan

Printed in Japan
861100700 ® HS

Adjustment Manual

1. ADJUSTMENT PROCEDURE

Refer to the service manual for the disassembling methods of each parts.

Note
Avoid the direct entrance of laser rays into the eyes and exposure of the body to laser rays which are dangerous. Especially be careful during the electric and optical pick-up adjustments, because a laser beam is radiated from the lens of the optical pick-up when the power supply is turned on. Follow the adjusting procedure in the manual.

1-1. Preparation for Electric Adjustments

① Remove the cabinet, and front panel.
② Remove the power switch rod.
③ Release the optical pick-up lock by pressing in the lock shaft located at the bottom (▲ (Lock) → ▬ (Free)). See Fig. 1 below.

(Note 1)
The pick-up detects signals recorded on the disc with a laser beam. The pick-up moves as the programs are played back but the movement is not visible from the outside.

Caution:

- Be sure to remove a disc from the player and lock the pick-up by pressing in the lock shaft, when the player is transported or disassembled. Otherwise, the disc loading mechanism is shifts and can be damaged.

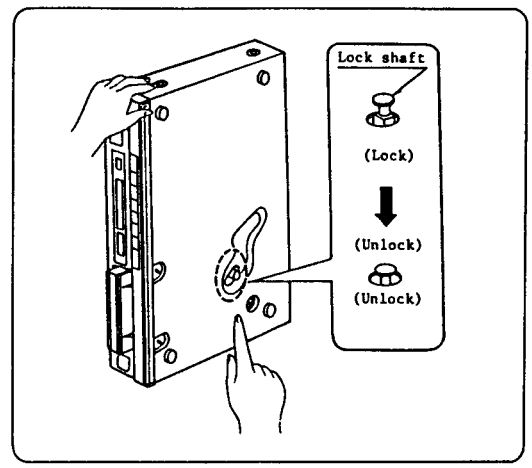
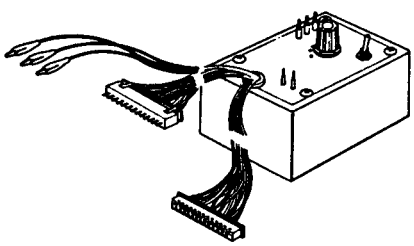


Fig.1 Lock Shaft

1-2. Measuring Instruments and Special Tools

Special tools are required prior to starting electric and optical pick-up adjustments.
The special tools are available through the ordinary part supply route.

1. Servo gain adjuster (SZZP1017F)



2. Test disc

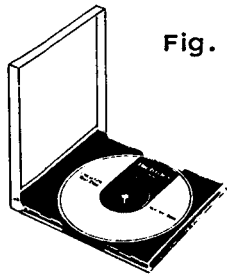
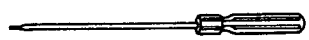


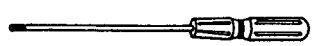
Fig. 2

- Test disc (SZZP1014F) old type
- Test disc (SZZP1014F) new type
- Inspection test disc (SZZ1054C)
- Uneven disc (SZZP1056C)
- Black band disc (SZZP1057C)

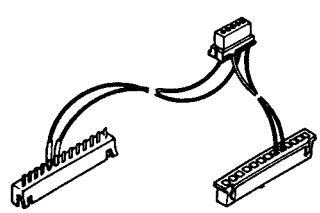
6. Adjusting screwdirver (SZZP1043C)



7. Allen wrench (1.5 mm) (SZZP1044C)

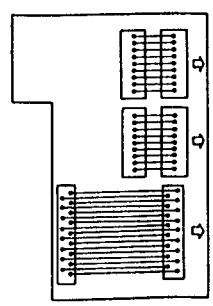


8. Conversion connector (SZZP1032F)

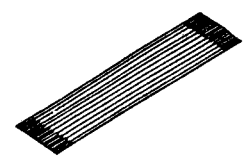


3. Ordinary disc
4. 2-channel oscilloscope (with external trigger more than 30MHz)
5. Low frequency oscillator
6. Adjusting screwdriver --SZZP1043C
7. Allen wrench --------SZZP1044C
9. General servicing tools

10. Junction PCB (SZZP1070C)



11. Junction FPC cord (SZZP1071C)



- **TEST DISC (SZZP1014F) old type**
- TESTDISK (SZZP1014F); alte Ausführung
- DISQUE D'ESSAI (SZZP1014F) - ancien type
- PRUEBA DE DISCO (SZZP1014F) tipo antiguo

Contents

TR	PURPOSE	SIGNAL	Time
		(TOC)	
1	Servo adjustment	Wobble Tone - 10dB L+R	2'00"
2	Pickup assymetry adjustment	Wobble Tone -10dB L+R	5'00"
3	Reference	1 kHz 0 dB L+R	1'00"
4	Freq. Response	20kHz 0 dB L+R	0'30"
5	Emphasis	16 kHz -0.96 L+R	0'30"
6	Channel Separation	L 1kHz 0 dB R-∞	0'30"
7	Channel Separation	R 1kHz 0 dB L-∞	0'30"
8	Dynamic range	1 kHz -60 dB L+R	1'00"
9	Linearity	1 kHz -80 dB L+R	1'00"
10	S/N	- ∞	2'00"
11	THD	1 kHz 0 dB L+R	1'00"
12	Black Spot	Wobble Tone -10 dBL+R	5'00"
13	Black Spot	Wobble Tone -10 dBL+R	5'00"
14	Finger Print	Wobble Tone -10 dBL+R	5'00"
15	Finger Print	Wobble Tone -10 dBL+R	9'00"
16	Wedge	Wobble Tone -10 dBL+R	4'00"
17	Wedge	Wobble Tone -10 dBL+R	4'00"
18	Reference	1 kHz 0 dB L+R	0'30"
19	Freq. Response	15 Hz	0'30"
20	Freq. Response	20	0'30"
21	Freq. Response	50	0'30"
22	Freq. Response	100	0'30"
23	Freq. Response	200	0'30"
24	Freq. Response	500	0'30"
25	Freq. Response	2K	0'30"
26	Freq. Response	5K	0'30"
27	Freq. Response	10K	0'30"
28	Freq. Response	12K	0'30"
29	Freq. Response	15K	0'30"
30	Freq. Response	18K	0'30"
31	Freq. Response	20K	0'30"
32	Channel Separation	L 100Hz 0 dB R - ∞	0'30"
33	Channel Separation	R 100Hz 0 dB L - ∞	0'30"
34	Channel Separation	L 10kHz 0 dB R - ∞	0'30"
35	Channel Separation	R 10kHz 0 dB L - ∞	0'30"
36	Channel Separation	L 20kHz 0 dB L - ∞	0'30"
37	Channel Separation	R 20kHz 0 dB L - ∞	

* This old type test disc has been changed to new type (CDT-002)

* This old type test disc has 37 tracks and display shows 37 tracks when this disc is played

* Characteristics of old type and new type (CDT-002) are identical. Both disc can be used for same purpose.

- **TEST DISC (SZZP1014F) new type**
- TESTDISK (SZZP1014F); neue Ausführung
- DISCHE D'ESSAI (SZZP1014F) - nouveau type
- PRUEBA DE DISCO (SZZP1014F) tipo nuevo

Contents

TR	PURPOSE	SIGNAL	Time
1	Reference	1 kHz L+R 0dB	1'40"
2	S/N	1 kHz L+R -	1'40"
3	Separation	1 kHz L 0dB	1'40"
4	Separation	1 kHz R 0dB	1'40"
5	Dynamic Range	1 kHz L+R -24dB	1'40"
6	Emphsis	16kHz L+R 0dB	1'40"
7	Black Band 0.4 mm	400Hz L+R -10dB	3'00"
8	Black Band 0.5 mm	400Hz L R -10dB	2'30"
9	Wedge 0.7 mm	400Hz L+R -10dB	5'00"
10	Fingerprint No.3	400Hz L+R -10dB	2'00"
11	Index	1.440Hz L+R -10dB 2.880Hz L+R -10dB 3.1760Hz L+R -10dB	8'00" 8'00" 1'00"
12	Repeat check	1 kHz L+R 0dB	0'05"

- **INSPECTION TEST DISC (SZZP1054C) CDT-016**
- INSPEKTIONSDISK (SZZP1054C) CDT-016
- DISQUE D'ESSAI D'INSPECTION (SZZP1054C)CDT-016
- DISCO DE PRUEBA DE INSPECCION (SZZP1054C)CTD-016

Contents

TR	PURPOSE	SIGNAL	Time
1	Reference	1 kHz L+R 0dB	1'00"
2	Reference	400Hz L+R 0dB	1'40"
3	Wedge 0.4 mm	400Hz L+R -10dB	2'10"
4	Wedge 0.5 mm	400Hz L+R -10dB	2'20"
5	Wedge 0.6 mm	400Hz L+R -10dB	2'20"
6	Wedge 0.7 mm	400Hz L+R -10dB	2'40"
7	Wedge 0.8 mm	400Hz L+R -10dB	2'40"
8	Wedge 0.9 mm	400Hz L+R -10dB	3'10"
9	Black dot 0.3 mm	400Hz L+R -10dB	3'55"
10	Black dot 0.4 mm	400Hz L+R -10dB	4'10"
11	Black dot 0.5 mm	400Hz L+R -10dB	4'20"
12	Black dot 0.6 mm	400Hz L+R -10dB	5'05"
13	Black dot 0.7 mm	400Hz L+R -10dB	5'10"
14	Black dot 0.8 mm	400Hz L+R -10dB	6'05"
15	Black dot 0.9 mm	400Hz L+R -10dB	9'45"

- **UNEVEN DISC (SZZP1056C)**

Structure : Ordinary disc with small piece for uneveness
Usage : Optical pick up mechanical adjustment

- **BLACK BAND DISC (SZZP1057C)**

Structure : Ordinary disc with 0.5 mm width tape at both side
Usage : Adjustment for regular size FF1 CD player

(1) Tracking offset adjustment
(2) Focus offset adjustment

2. ADJUSTMENT AND TEST POINT LOCATIONS
2. EINSTELLUNG UND LAGE DER MESSPUNKTE
2. RÉGLAGE ET EMPLACEMENTS DES POINTS DE MESURE
2. POSICION DEL AJUSTE Y EL PUNTO DE PRUEBA

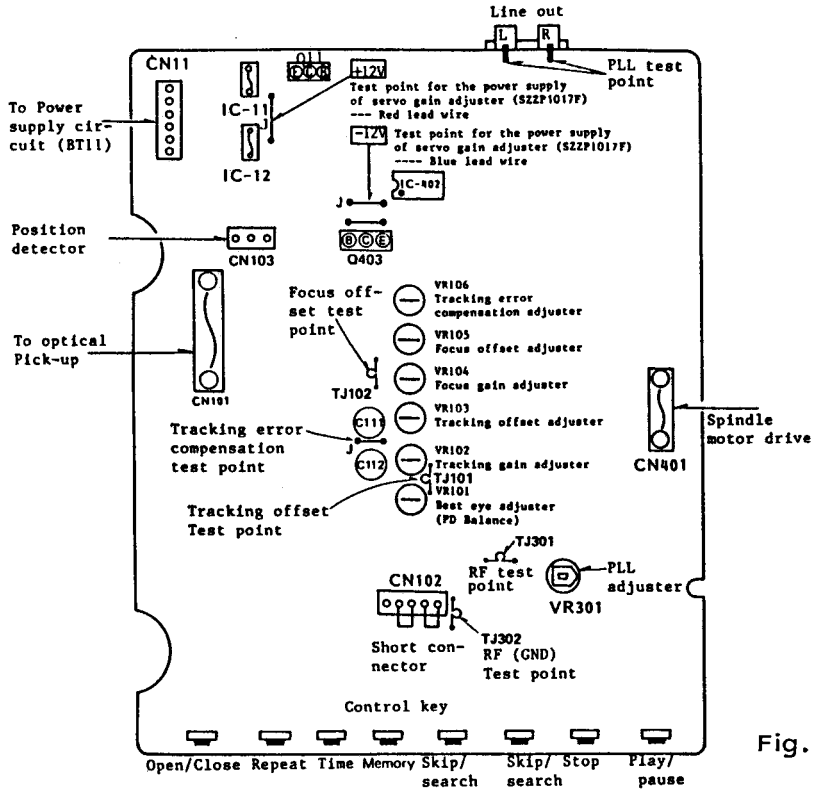


Fig. 3 Main circuit

2-1. Servo gain adjuster and its connection
2-1. Servo-Verstärkungsregler mit Anschluß
2-1. Ajusteur de l'amplification asservie et son raccordement
2-1. Ajustador de ganacia de servo y su conexión

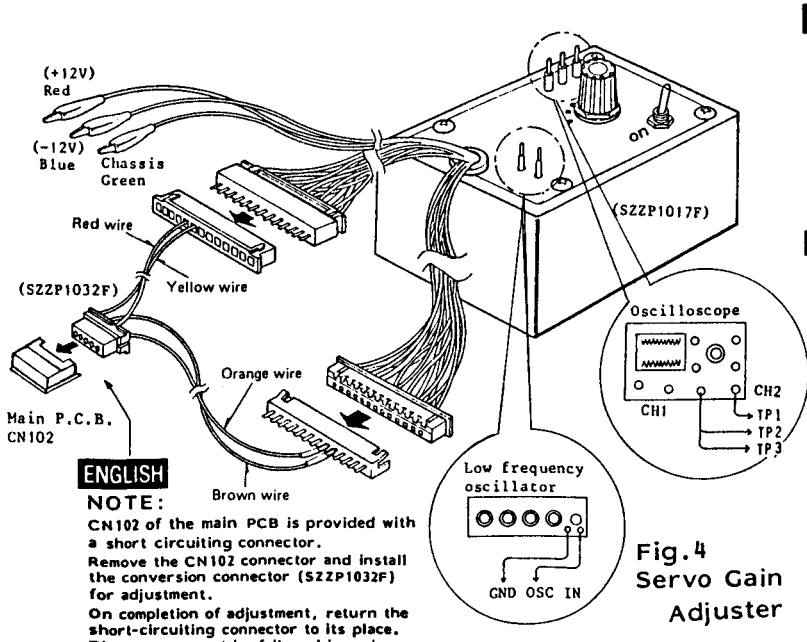


Fig. 4 Servo Gain Adjuster

ENGLISH

NOTE:

CN102 of the main PCB is provided with a short circuiting connector.
Remove the CN102 connector and install the conversion connector (SZZP1032F) for adjustment.
On completion of adjustment, return the short-circuiting connector to its place.
These steps must be followed in order.

Caution: Do not look into the lens when power is applied to the unit, since there is laser radiation (H.H.S./D.H.W./etc., regulation).

DEUTSCH **HINWEIS:**

CN102 der Haupt-Schaltplatte ist mit einem Kurzschlußschaltstück versehen.
Den CN 105-Steckkontakt abnehmen und während der Einstellung den Konverter-stecker (SZZP1032F) anbringen.
Diese Schritte müssen in der beschriebenen Reihenfolge durchgeführt werden.
Vorsicht: Bei eingeschaltetem Gerät nicht in die Linse schauen, da Laserstrahlen abgegeben werden (Vorschriften H.H.S/D.H.W/usw.)

FRANÇAIS **NOTA:**

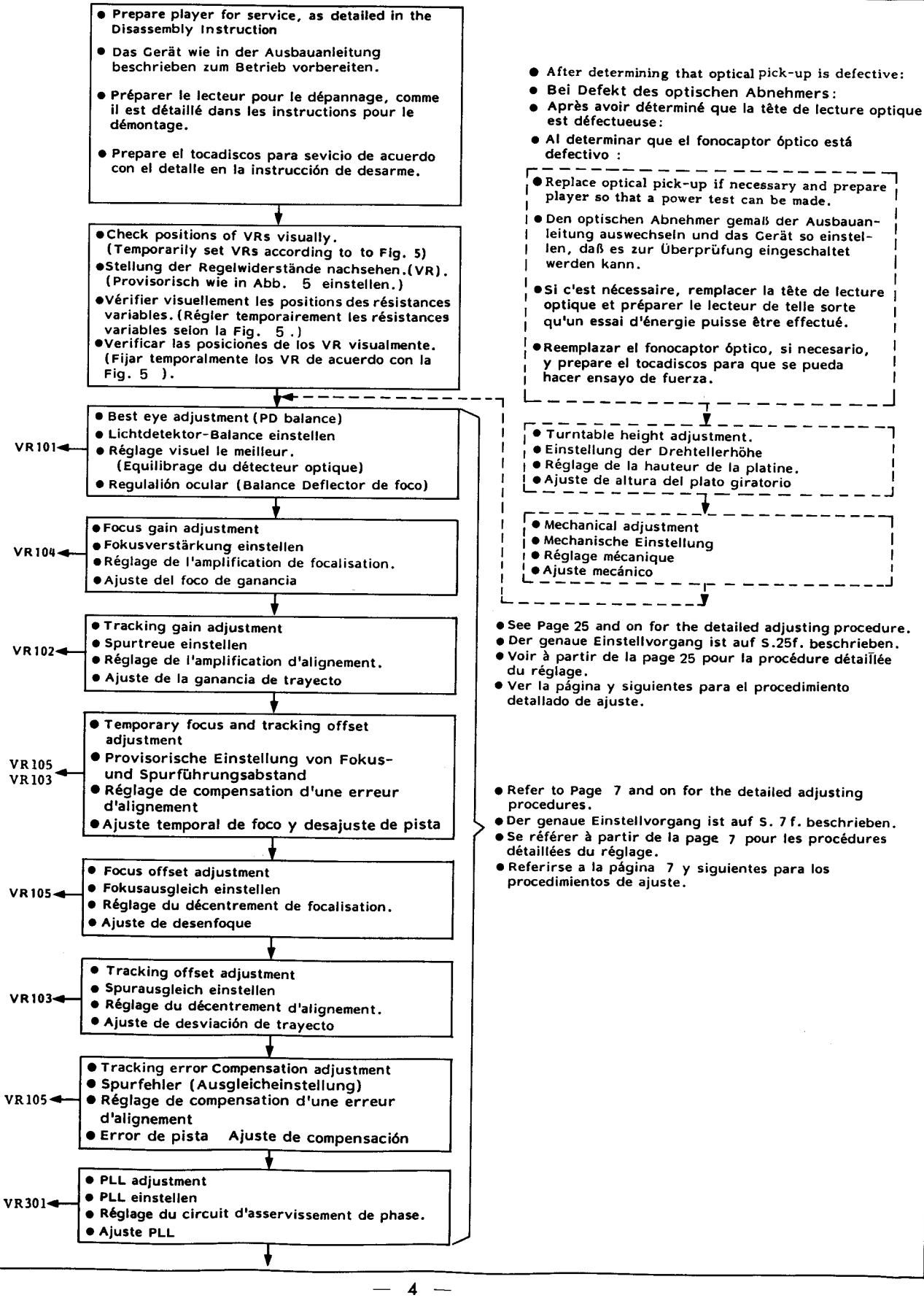
CN102 de la plaquette à circuits imprimés principale est muni d'un connecteur de court-circuitage.
Retirer le connecteur CN 105 et installer le connecteur de conversion (SZZP1032F) pour le réglage.
Une fois achevé le réglage, remettre le connecteur de court-circuitage à son emplacement.
Ces étapes doivent être suivies dans l'ordre.
Avertissement: Ne pas regarder dans la lentille lorsque l'énergie est appliquée à l'appareil, étant donné qu'il y a un rayonnement du laser (directives H.H.S./D.H.W/etc.,).

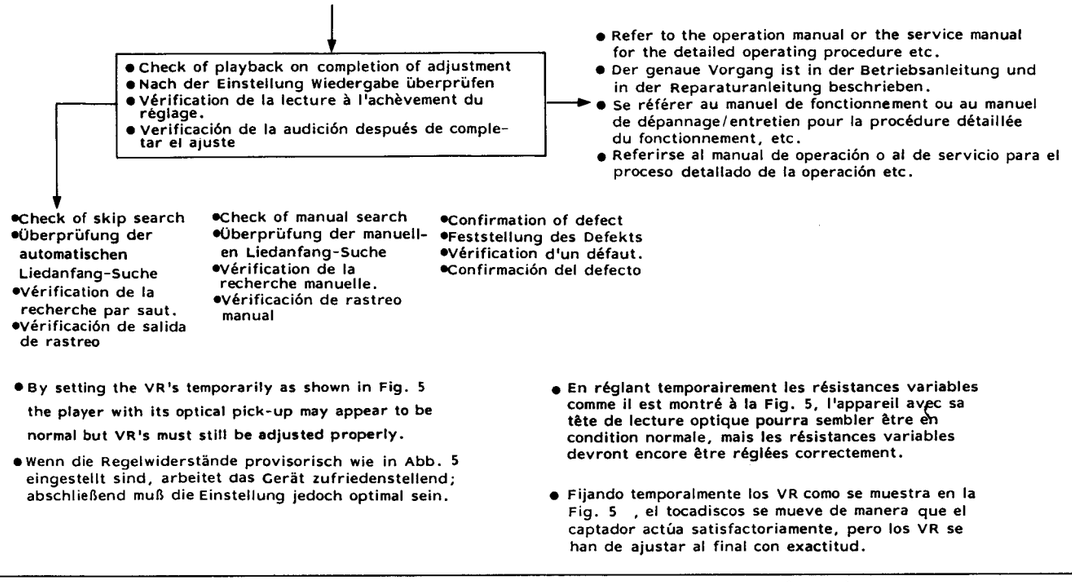
ESPAÑOL **NOTA:**

E1 CN102 de la tablilla de circuitos impresos, está provisto de quitar el conector CN105 e instalar el conector de conversión (SZZP1032F) para el ajuste.
Al terminar el ajuste, se devuelva el conector de cortocircuito a su lugar. Estos pasos debe seguirse en orden.

Cuidado: No semire adentro del lente cuando la fuerza se aplique al grupo, por lo que se encuentra radiación de laser. (H.H.S./D.H.W./etc., regulación).

3. ELECTRON ADJUSTMENT STEPS
3. SCHRITTE UND VORGÄNGE BEI DER ELEKTRONISCHEN EINSTELLUNG
3. ÉTAPES POUR LE RÉGLAGE ÉLECTRONIQUE
3. PASOS Y PUNTOS DEL AJUSTEELECTRÓNICO


● Prepare player for service, as detailed in the Disassembly Instruction
● Das Gerät wie in der Ausbauanleitung beschrieben zum Betrieb vorbereiten.
● Préparer le lecteur pour le dépannage, comme il est détaillé dans les instructions pour le démontage.
● Prepare el tocadiscos para sevicio de acuerdo con el detalle en la instrucción de desarme.
● Check positions of VRs visually. (Temporarily set VRs according to to Fig. 5)
●Stellung der Regelwiderstände nachsehen.(VR). (Provisorisch wie in Abb. 5 einstellen.)
●Vérifier visuellement les positions des résistances variables. (Régler temporairement les résistances variables selon la Fig. 5 .)
●Verificar las posiciones de los VR visualmente. (Fijar temporalmente los VR de acuerdo con la Fig. 5).
● Best eye adjustment (PD balance)
● Lichtdetektor-Balance einstellen
● Réglage visuel le meilleur. (Equilibrage du détecteur optique)
● Regulalión ocular (Balance Deflector de foco)
VR101
● Focus gain adjustment
● Fokusverstärkung einstellen
● Réglage de l'amplification de focalisation.
● Ajuste del foco de ganancia
VR104
● Tracking gain adjustment
● Spurtreue einstellen
● Réglage de l'amplification d'alignement.
● Ajuste de la ganancia de trayecto
VR102
● Temporary focus and tracking offset adjustment
● Provisorische Einstellung von Fokus- und Spurführungsabstand
● Réglage de compensation d'une erreur d'alignement
● Ajuste temporal de foco y desajuste de pista
VR105
VR103
● Focus offset adjustment
● Fokusausgleich einstellen
● Réglage du décentrement de focalisation.
● Ajuste de desenfoque
VR105
● Tracking offset adjustment
● Spurausgleich einstellen
● Réglage du décentrement d'alignement.
● Ajuste de desviación de trayecto
VR103
● Tracking error Compensation adjustment
● Spurfehler (Ausgleicheinstellung)
● Réglage de compensation d'une erreur d'alignement
● Error de pista Ajuste de compensación
VR105
● PLL adjustment
● PLL einstellen
● Réglage du circuit d'asservissement de phase.
● Ajuste PLL
VR301
● After determining that optical pick-up is defective:
● Bei Defekt des optischen Abnehmers:
● Après avoir déterminé que la tête de lecture optique est défectueuse:
● Al determinar que el fonocaptor óptico está defectivo :
● Replace optical pick-up if necessary and prepare player so that a power test can be made.
● Den optischen Abnehmer gemaß der Ausbauanleitung auswechseln und das Gerät so einstellen, daß es zur Überprüfung eingeschaltet werden kann.
●Si c'est nécessaire, remplacer la tête de lecture optique et préparer le lecteur de telle sorte qu'un essai d'énergie puisse être effectué.
●Reemplazar el fonocaptor óptico, si necesario, y prepare el tocadiscos para que se pueda hacer ensayo de fuerza.
● Turntable height adjustment.
● Einstellung der Drehtellerhöhe
● Réglage de la hauteur de la platine.
● Ajuste de altura del plato giratorio
● Mechanical adjustment
● Mechanische Einstellung
● Réglage mécanique
● Ajuste mecánico
● See Page 25 and on for the detailed adjusting procedure.
● Der genaue Einstellvorgang ist auf S.25f. beschrieben.
● Voir à partir de la page 25 pour la procédure détaillée du réglage.
● Ver la página y siguientes para el procedimiento detallado de ajuste.
● Refer to Page 7 and on for the detailed adjusting procedures.
● Der genaue Einstellvorgang ist auf S. 7 f. beschrieben.
● Se référer à partir de la page 7 pour les procédures détaillées du réglage.
● Referirse a la página 7 y siguientes para los procedimientos de ajuste.


● Check of playback on completion of adjustment
● Nach der Einstellung Wiedergabe überprüfen
● Vérification de la lecture à l'achèvement du réglage.
● Verificación de la audición después de completar el ajuste
● Refer to the operation manual or the service manual for the detailed operating procedure etc.
● Der genaue Vorgang ist in der Betriebsanleitung und in der Reparaturanleitung beschrieben.
● Se référer au manuel de fonctionnement ou au manuel de dépannage/entretien pour la procédure détaillée du fonctionnement, etc.
● Referirse al manual de operación o al de servicio para el proceso detallado de la operación etc.
●Check of skip search
●Überprüfung der automatischen Liedanfang-Suche
●Vérification de la recherche par saut.
●Vérificación de salida de rastreo
●Check of manual search
●Überprüfung der manuellen Liedanfang-Suche
●Vérification de la recherche manuelle.
●Vérificación de rastreo manual
●Confirmation of defect
●Feststellung des Defekts
●Vérification d'un défaut.
●Confirmación del defecto

● By setting the VR's temporarily as shown in Fig. 5 the player with its optical pick-up may appear to be normal but VR's must still be adjusted properly.

● Wenn die Regelwiderstände provisorisch wie in Abb. 5 eingestellt sind, arbeitet das Gerät zufriedenstellend; abschließend muß die Einstellung jedoch optimal sein.

● En réglant temporairement les résistances variables comme il est montré à la Fig. 5, l'appareil avec sa tête de lecture optique pourra sembler être en condition normale, mais les résistances variables devront encore être réglées correctement.

● Fijando temporalmente los VR como se muestra en la Fig. 5 , el tocadiscos se mueve de manera que el captador actúa satisfactoriamente, pero los VR se han de ajustar al final con exactitud.

4. INITIAL SETTING OF VARIABLE RESISTORS (VR)
4. VORLÄUFIGE EINSTELLNG DER REGELWIDERSTÄNDE (VR)
4. RÉGLAGE INITIAL DES RÉSISTANCES VARIABLES (VR)
4. FIJACION INICIAL DE LAS RESISTENCIAS VARIABLES DE AJUSTE (VR)

ENGLISH

● Adjusting Variable Resistors and Test Points

The player operates, but not at its best with the initial setting of the variable resistors. Adjust them according to the proper procedure.

Perform the electronic adjustment when any electric part is replaced. Perform ① optical pick-up adjustment and ② electronic adjustment in the stated order, when the optical pick-up (SOAD30A) is replaced.

For adjusting the variable resistors, view the drawing to the right of the above Fig. 5.
All the electronic adjustments are possible by adjusting as shown in Fig. 5.
(Remove the power supply switch rod for the convenience of adjustment.)

DEUTSCH

● Einstellung der Regelwiderstände und der Prüfkontakte

Bei der oben dargestellten Stellung der Regelwiderstände funktioniert das Gerät, aber nicht optimal. Gemäß dem Einstellvorgang einstellen.

Die elektrische Einstellung muß immer durchgeführt werden, wenn ein elektrisches Teil ausgewechselt wird. Bei Auswechseln des optischen Abnehmers immer ① die Einstellung des optischen Abnehmers und ② elektrische Einstellung in dieser Reihenfolge durchführen. (Optischer Abnehmer = SO AD 30A)

Die Regelwiderstände an der Seitenfläche können alle wie in Abb. 5 eingestellt werden. (Um die Arbeit bei der Einstellung zu erleichtern, kann der Schaltstab des Netzschalters abgenommen werden.)

FRANÇAIS

● Réglage des résistances variables et des points de mesure

L'appareil fonctionne, mais non dans les conditions optima du réglage initial des résistances variables. Les régler selon la procédure appropriée.

Réaliser un réglage électronique lorsque n'importe quel élément électrique est remplacé. Effecturer ① le réglage de la tête de lecture optique et ② le réglage électronique dans l'ordre indiqué, lorsque la tête de lecture optique (SOAD30A) est remplacée.

Pour le réglage des résistances variables, voir le schéma à la droite de la Fig. 5 ci-dessus.
L'ensemble des mises au point électroniques est possible en réglant comme il est montré à la Fig. 5.
(Retirer la tige d'attaque de l'interrupteur d'alimentation pour la commodité de l'ajustement.)

ESPAÑOL

● inicial de las resistencias variables.

Se tien que hacer un ajuste electrónico cuando se cambia cualquier pieza eléctrica. Hacer ①primero el ajuste del colector óptico y luego②el ajuste electrónico en el orden debidos cuando se cambie el colector óptico (SOAD30A)

los ajustes
electrónicos haciendo la fijación tal como indica la Fig. 5.

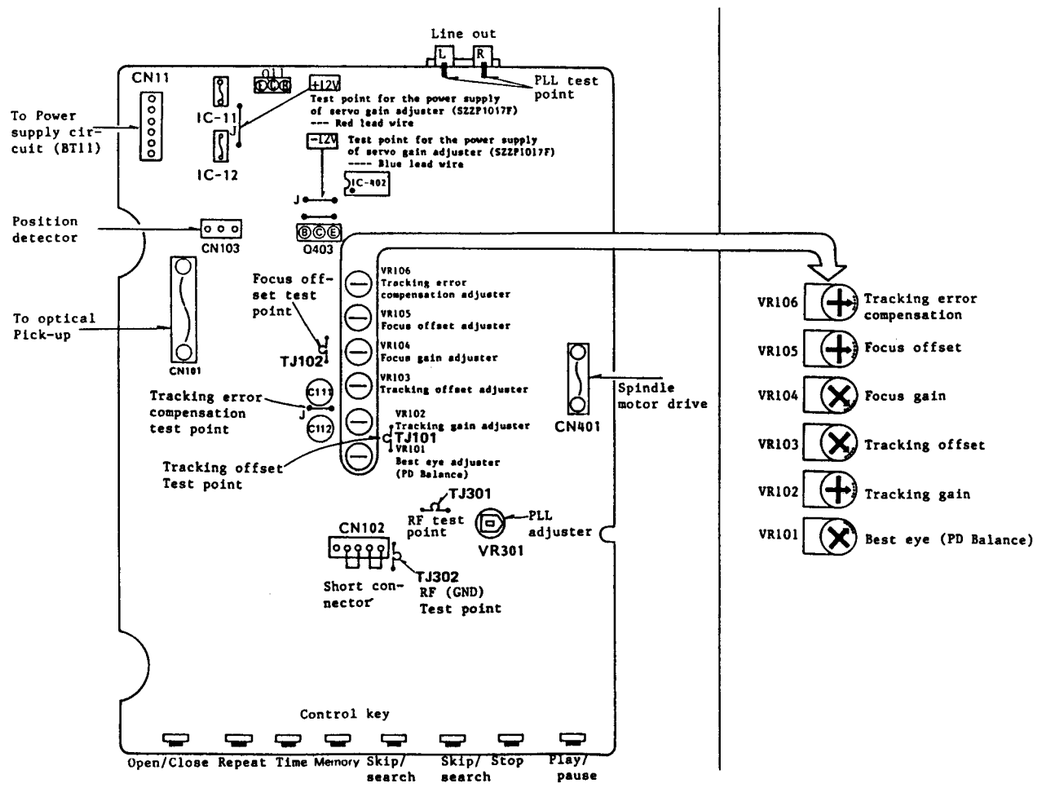


Fig. 5 Main circuit

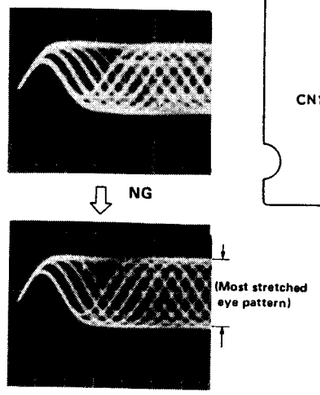
5. ELECTRONIC ADJUSTMENT PROCEDURE
5. EINSTELLVORGANG FÜR ELEKTRONIK
5. PROCÉDURE POUR LE RÉGLAGE ELECTRONIQUE
5. PROCEDIMIENTO DEL AJUSTE ELECTRONICO

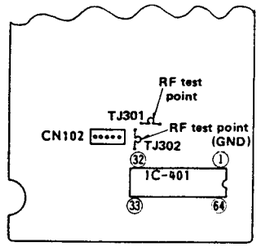
ENGLISH A. Best Eye (PD Balance) Adjustment

(1) Connect CH-1 of the oscilloscope to the RF test point (TJ301) and the grounding test Point (TJ302) on the main PCB as shown in the illustration.

Oscilloscope setting ---
- Volt : 500 mV
- Sweep : 0.5 µsec
- Input : AC

(2) Turn on the power supply switch of the player.
(3) Place the test disc (SZZP1014F) or (SZZP1054C) into the disc holder by open/close button.
(4) The player to the play mode.
(5) Play of the test disc. (BS 0.5mm)
SZZP1014F (Old) ----- Track 13
(New) ----- Track 8
SZZP1054C ---------- Track 11
(6) Adjust VR101 so that the eye pattern of RF signal is stretched to maximum as shown in the illustration.
(7) Turn off the power supply switch of the player.





Main PCB

Fig. 6 Best eye

DEUTSCH A. Einstellung der Lichtdetektor-Balance (Best Eye)

(1) CH-1 des Oszilloskops an den RF-Meßpunkt (TJ301) und an den Erdungsmeßpunkt (TJ302) der Haupt-Schaltplatte wie in der Abbildung gezeigt anschließen.

Einstellung des Oszilloskops ---
- Spannung : 500 mV
- Ablenkung : 0,5 µs
- Eingang : Wechselstrom

(2) Die Stromversorgung des Geräts einschalten.
(3) Testdisk SZZP1014F oder SZZP1054C durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.
(4) Das Gerät auf Wiedergabe stellen.
(5) Testdisk abspielen (BS 0,5mm)
SZZP1014F (alt) -------- Spur 13
(neu)-------- Spur 8
SZZP1054C ---------- Spur 11
(6) VR 101 so einstellen, daß das RF-Signal so gedehnt wie möglich (s. Abbildung) erscheint.
(7) Die Stromzufuhr zum Gerät abschalten.

FRANÇAIS A. Réglage visuel le meilleur (Equilibrage du détecteur optique)

(1) Raccorder le canal 1 de l'oscilloscope au point de mesure haute fréquence (TJ301) et au point de mesure de mise à la terre (TJ302) sur la plaquette à circuits imprimés principale, comme il est montré sur l'illustration.

Réglages de l'oscilloscope
- Tension ..... 500 mV
- Balayage ..... 0,5 µsec.
- Sélecteur d'entrée ... C.A.

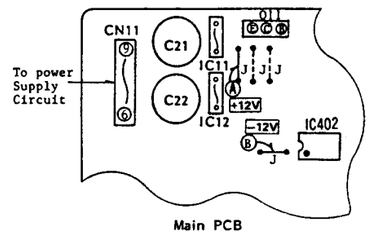
(2) Mettre en marche l'interrupteur d'alimentation du lecteur.
(3) Installer le disque d'essai (SZZP1014F) ou (SZZP1054C) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture.
(4) Régler le lecteur sur le mode d'audition.
(5) Faire jouer le disque d'essai. (Zone d'interférence de 0,5 mm)
SZZP1014F (Ancien) ----- Piste 13
(Nouveau)---- Piste 8
SZZP1054C ---------- Piste 11
(6) Régler VR101 de telle sorte que l'oscillogramme visuel du signal de haute fréquence soit étiré au maximum, comme il est montré sur l'illustration.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

ESPAÑOL A. Ajuste ocular mejor (Balance del detector óptico)

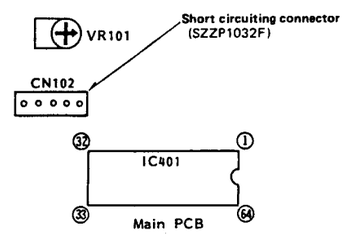
(1) Conectar el Canal-1 del osciloscopio al punto RF de prueba (TJ301) y el punto de prueba de masa (TJ302) de la tablilla de circuítos impresos como muestra la figura.

Fijación del osciloscopio ---
- Voltaje : 500mV
- Barrido : 0,5 µseg
- Potencia de entrada : CA

(2) Encender el interruptor de la fuente de energía del tocadiscos.
(3) Poner el disco de prueba (SZZP1014F) o (SZZP1054C) en el soporte del disco por medio del botón de abrir y cerrar.
(4) El todadiscos en el moao de audición.
(5) Hacer funcionar el disco de prueba. (BS 0,5mm)
SZZP1014 (antiguo) ----- Pista 13
(nuevo)------- Pista 8
SZZP1054C---------- Pista 11
(6) Ajustar la VR101 de manera que el módulo visual de la señal RF sea extensa al máximo, como muestra la figura.
(7) Apagar el interruptor de fuente de energía del tocadiscos.



Main PCB



Main PCB

Fig. 7

Initial setting mode of servo gain adjuster

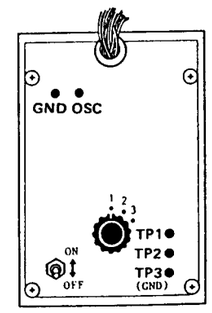
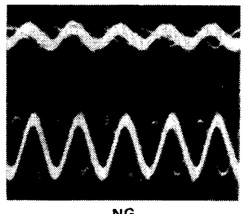


Fig. 8

Servo Gain Adjuster (SZZP1017F)

(1) mode select switch to "2" position.
(2) ON/OFF switch to "ON" position.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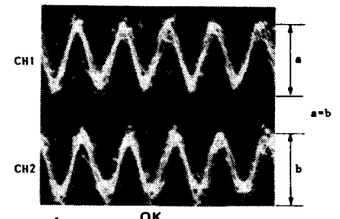


OK

Fig. 9 Focus gain

B. Focus Gain Adjustment

(1) Connect the servo gain adjuster (SZZP1017F) with conversion connector (SZZP1032F) to the player as shown in the illustration.

Connecting points
- Red lead wire -----Ⓐ Jumper +12V near Q11 terminals on the main PCB.
- Blue lead wire -----Ⓑ Jumper -12V near IC402 on the main PCB.
- Green read wire ---Chassis
- Connector-------- Remove the short-circuiting plug CN102 on the Main PCB and connect the conversion connector (SZZP1032F).

(2) Set the low frequency oscillator to a frequency 750 Hz and an output voltage of 150m Vp-p. Then connect the oscillator to the terminals OSC IN and GND of the servo gain adjuster (SZZP1017F).
(3) Connect CH-1 and CH-2 of the oscilloscope to TP1 and TP2 of the Servo gain adjuster (SZZP1017F). (TP3 is the grounding terminal.)

Oscilloscope setting --
- Volt ..... 100 mV
- Sweep ..... 1 ms
- Input selector..... DC

(4) Turn on the power supply switch of the player.
(5) Place the test disc (SZZP1014F) or (SZZP1054C) in to the disc holder by open/close button and in the Playback mode.
(6) Set the rotary switch of the servo gain adjuster (SZZP1017F) to "2" → "1".

(7) The player to the Play mode, the 750 Hz signal will be displayed on the oscilloscope. Then adjust **VR104** so that the waveforms and amplitudes of **both channels shall be equal** as shown in the illustration.
(8) Turn off the power supply switch of the player.

(Note) Please Do not remove the servo gain adjuster also shorting connector.

B. Einstellung der Fokusverstärkung

(1) Den Servo-Verstärkungsregler (SZZP1017F) mit Hilfe des Konverter-Steckkontakts (SZZP1032F) wie in der Abbildung gezeigt an das Gerät anschließen.

Anschlußpunkte:
- Roter Draht ---- Brücke A +12V neben den Q11-Kontakten auf der Haupt-Schaltplatte
- Blauer Draht --- Brücke B -12V neben dem IC402-Kontakt auf der Haupt-Schaltplatte
- Grüner Draht--- Chassis
- Stecker -------- Kurzschlußkontakt von CN102 auf der Haupt-Schaltplatte entfernen und den Konverter-Steckkontakt (SZZP1032F) anschließen. Den Steckkontakt mit der Konverterseite (5 Nadeln) an CN 102 anschließen.

(2) Auf dem Niederfrequenz-Oszillator eine Frequenz von 750 Hz und Ausgangsspannung von 150mVp-p einstellen, dann den Oszillator an die Klemmen OSC IN und GND des Servo-Verstärkungsreglers anschließen (SZZP1017F).
(3) CH-1 und CH-2 des Oszilloskops an TP1 und TP2 des Servoverstärkungsreglers (SZZP1017F) anbringen. (TP3 ist die Erdungsklemme.)

Einstellung des Oszilloskops:
- Spannung ..... 100 mV
- Ablenkung ..... 1 ms
- Eingangsumschalter ..... Gleichstrom

(4) Die Stromversorgung des Geräts einschalten.
(5) Testdisk SZZP1014F oder SZZP1054C durch Betätigung der Auf/Zu-Taste in das Gerät einlegen und auf Wiedergabe-Betrieb schalten.
(6) Den Schaltknopf für den Servo-Verstärkungsregler (SZZP1017F) von "2" auf "1" stellen.
(7) Wenn das Gerät auf Wiedergabe geschaltet ist und das 750Hz-Signal auf dem Oszilloskop erscheint, muß VR104 so eingestellt werden, daß die Signalformen und Amplitüden beider Kanäle gleich sind (s. Abb.).
(8) Die Stromversorgung des Geräts abschalten.

(Hinweis) Kurzschlußstecker und Stecker des Servo-Verstärkungsreglers bitte nicht abnehmen.

B. Réglage de l'amplification de focalisation

(1) Raccorder l'ajusteur de l'amplification asservie (SZZP1017F) avec le connecteur de conversion (SZZP1032F) au lecteur, comme il est montré sur l'illustration.

Points de raccordement:
- Fil de jonction rouge ---- Ⓐ Jarretière +12V près des bornes Q11 sur la plaquette à circuits imprimés principale.
- Fil de jonction bleu ---- Ⓑ Jarretière -12V près de IC402 sur la plaquette à circuits imprimés principale.
- Fil de jonction vert ---- Châssis
- Connecteur----- Retirer la fiche de court-circuitage de CN102 sur la plaquette à circuits imprimés principale et raccorder le connecteur de conversion (SZZP1032F).

(2) Régler l'oscillateur à basses fréquences sur une fréquence de 750 Hz et une tension de sortie de 150 mV crête-à-crête. Puis, brancher l'oscillateur aux bornes OSC IN (entrée d'oscillateur) et GND (terre) de l'ajustteur d'amplification asservie (SZZP1017F).
(3) Raccorder le canal 1 et le canal 2 de l'oscilloscope à TP1 et TP2 de l'ajusteur d'amplification asservie (SZZP1017F). (TP3 est la borne de mise à la terre.)

Réglages de l'oscilloscope:
- Tension ..... 100 mV
- Balayage ..... 1 ms
- Sélecteur d'entrée ... C.C.

(4) Mettre en marche l'interrupteur d'alimentation du lecteur.
(5) Installer le disque d'essai (SZZP1014F) ou (SZZP1054C) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture et en réglant sur le mode de lecture.
(6) Régler le commutateur rotatif de l'ajusteur d'amplification asservie (SZZP1017F) sur "2" →"1".
(7) Le lecteur étant sur le mode de lecture, un signal de 750 Hz sera affiché sur l'oscilloscope. Puis, régler VR104 de telle sorte que les formes d'ondes et les amplitudes des deux canaux soient égales, comme il est montré sur l'illustration.
(8) Mettre hors circuit l'interrupteur d'alimentation en courant du lecteur.

(Nota) Veuillez ne pas retirer l'ajusteur de l'amplification asservie ainsi que le connecteur de court-circuitage.

B. Ajuste de ganancia de foco

(1) Conectar el ajustador de ganancia de servo (SZZP1017F) con el conector de conversión (SZZP1032F) al tocadiscos como muestra la figura.

- Hilo conductor rojo ------ (A) Puente +12V junto a los terminales Q11 en la tablilla de circuítos imprsos principal.
- Hilo conductor azul ---- (B) Puento -12V cerca del terminal IC402 en la tablilla de circuítos impresos principal.
- Hilo conductor verde -- Masa (chasis)
- Conector ------- Quitar el borne de cortocircuíto de CN102 en la tablilla principal de CN102 en la tablilla principal de circuitos impresos y empalmar el conector de conversión (SZZP1032F).

(2) Fijar el oscilador de baja frecuencia a una frecuencia de 750 Hz y un voltaje de potencia de salida de 150 mV_{p-p} y luego conectar el oscilador a los terminales OSC IN y TIERRA del ajustador de ganancia de servo (SZZP1017F).
(3) Conectar el CANAL-1 y el CANAL-2 al osciloscopio al TP1 y TP2 del ajustador de ganancia de servo (SZZP1017F).

Fijación del osciloscopio --
- Voltaje ..... 100 mV
- Barrido ..... 1 ms
- Selector de potencia de enrada ..... CD

(4) Encender el interruptor de la fuente de energía del tocadiscos.
(5) Colocar el disco de prueba (SZZP1014F) o (SZZP1054C) en el soporte del cisco por medio del botón de abrir/cerrar en el modo de audioreproducción.
(6) Fijar el interruptor rotativo del ajustador de ganacia de servo (SZZP1017F) en "2" → "1".
(7) Con el tocadiscos en el modo de audioreproducción en el osciloscopio se verá la señal de 750Hz, ajustándose luego VR104 de manera que las formas de onda y las amplitudes de ambos canales sean iguales como se muestra en la figura.
(8) Apagar el interruptor de la fuente de anergía del tocadiscos.

(Nota) No quitar el ajustador de ganacia de servo ni el conector de cortocircuíto.

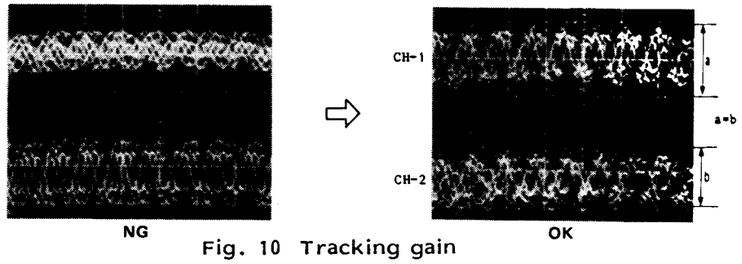


Fig. 10 Tracking gain

C. Tracking Gain Adjustment

(1) Set the low frequency oscillator to **1.0 kHz** and an output of **150 mVp–p**, and connect the oscillator to the OSC IN and GND of the gain adjuster **(SZZP1017F)**.
(2) Connect the CH-1 and CH-2 of the oscilloscope to the **TP1** and TP2 of the gain adjuster (SZZP1017F). (TP3 is a grounding terminal.)

Oscilloscope setting ---
- Volt : 100mV
- Sweep : 1.0ms
- Input selector : DC

(3) Turn on the power supply switch of the Player.
(4) Place the test disc **(SZZP1014F)** or **(SZZP1054C)** into the disc holder by open/close button and in the Playback mode.
(5) Set the rotary switch of the servo gain adjuster (SZZP1017F) to **"2" → "3"**.
(6) With the player to the play mode, the **1.0 kHz** signal will be displayed on the oscilloscope, then adjust **VR102** so that the waveforms and amplitudes of **both channels shall be equal** as shown in the illustration.
(7) Turn off the power supply switch of the player.
(8) After completing the above mentioned adjustment, **remove the servo gain adjuster and insert the shorting connector into CN102.**

C. Einstellung der Spurtreue

(1) Den Niederfrequenz-Oszillator auf eine Frequenz von **1.0kHz** und einen Ausgangswert von 150mVp-p einstellen und an OSC IN und GND des Verstärkungsreglers (SZZP1017F) anschließen.
(2) CH-1 und CH-2 des Oszilloskops an die Klemmen TP1 und TP2 des Verstärkungsreglers (SZZP1017F) anschließen. (TP3 ist eine Erdungsklemme).

Einstellung des Oszilloskops--
- Spannung 100mV
- Ablenkung **1.0ms**
- Eingangsumschalter ..... Gleichstrom

(3) Die Stromversorgung des Geräts einschalten.
(4) **Testdisk SZZP1014F oder SZZP1054C durch Betätigung der Auf/Zu-Taste in das Gerät einlegen und auf Wiedergabe-Betrieb schalten.**
(5) Den Schaltknopf für den Servo-Verstärkungsregler (SZZP1017F) von "2" auf "3" stellen.
(6) Wenn das Gerät auf Wiedergabe geschaltet ist und das 1,0kHz-Signal auf dem Oszilloskop erscheint, muß VR 102 so eingestellt werden, daß die Signalformen und Amplitüden beider Kanäle gleich sind (s.Abb.)
(7) Die Stromzufuhr zum Gerät abschalten.
(8) Nach beendigter Einstellung den Servo-Verstärkungsregler entfernen und das Kurzschlußschaltstück wie zu Anfang an CN102 anbringen.

C. Réglage de l'amplification d'alignement

(1) **Régler l'oscillateur de basses fréquences sur l,0 kHz et une sortie de 150 mV crête-à-crête, puis brancher l'oscillateur aux bornes OSC IN (entrée d'oscillateur) et GND (terre) de l'ajusteur d'amplification asservie (SZZP1017F).**
(2) **Raccorder le canal 1 et le canal 2 de l'oscilloscope à TP1 et TP2 de l'ajusteur d'amplification asservie (SZZP1017F). (TP3 est la borne de mise à la terre.)**

Réglages de l'oscilloscope --
- Tension ..... 100 mV
- Balayage 1.0ms
- Sélecteur d'entrée ... C.C.

(3) Mettre en marche l'interrupteur d'alimentation du lecteur.
(4) **Installer le disque d'essai (SZZP1014F) ou (SZZP1054C) dans le dispositif du support pour disque en utilisant la touche d'ouverture/fermeture et en réglant sur le mode de lecture.**
(5) Régler le commutateur rotatif de l'ajusteur d'amplification asservie (SZZP1017F) sur "2" → "3".
(6) Avec la lecteur sur le mode de lecture, un signal de 1,0 kHz sera affiché sur l'oscilloscope; puis, régler VR102 de telle sorte que les formes d'ondes et les amplitudes des deux canaux soient égales, comme il est montré sur l'illustration.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.
(8) Après l'achèvement du réglage mentionné ci-dessus, retirer l'ajusteur d'amplification asservie et insérer le connecteur de court-circuitage dans CN102.

C. Ajuste de gancia de trayectoria

(1) Ajustar el oscilador de baja frecuencia a la frecuencia de 1.0 kHz y una potencia de salida de 150mVp-p, y conectar el oscilador a OSC IN y TIERRA del ajustador de ganancia (SZZP1017F).
(2) Conectar el CANAL-1 y el CANAL-2 del osciloscopio a TP1 y TP2 del ajustador de ganancia (SZZP1017F). (TP3 es un terminal de tierra.)

Fijación del osciloscopio --
- Voltaje ..... 100 mV
- Barrido ..... 1.0 ms
- Selector de potencia de entrada..... CD

(3) Encender el interruptor de fuente de energía del tocadiscos.
(4) Colocar el disco de prueba (SZZP1014F) o (SZZP1054C) en el soporte del disco por medio de la tecla de abrir/cerrar y en el modo de audioreproducción.
(5) Fijar el interruptor rotativo del ajustador de ganancia de servo (SZZP1017F) en "2" → "1".
(6) Con el todaciscos en el modo de audioreproducción se verá en el osciloscopio la señal de 1,0kHz, ajustando luego VR102 de manera que las formas de onda y las amplitudes de ambos canales sean iguales, como muestra la figura.
(7) Apagar el interruptor de fuente de energía del tocadiscos.
(8) Después de completar los referidos ajustes, quitar el ajustador de ganancia de servo e insertar el conectador de cortocircuíto en CN102.

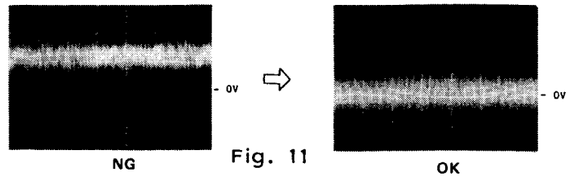


Fig. 11

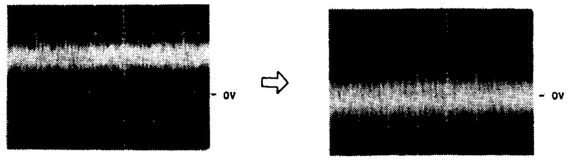
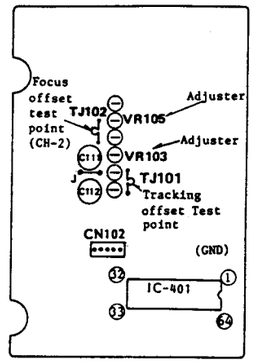


Fig. 12



Main PCB

D. Temporary focus and tracking offset adjustment

(Focus offset)
(1) Connect CH-1 of the oscilloscope to **TJ102** (Focus offset test point) and GND to the chassis.

Oscilloscope setting ---
- Volt : 100mV
- Sweep : 5ms
- Input selector : DC

(2) Turn on the power supply switch of the player.
(3) Place the test disc **(SZZP1057C . . . Black band disc)** into the disc holder by open/close botton.
(4) After TOC reading, the set will enter the stop mode. Then check the waveform on the oscilloscope and adjust **VR105**, so that the waveform at TJ102 is at 0V (**Ground level**) as shown in the illustration.

(Tracking offset)
(1) Connect CH-1 of the oscilloscope to **TJ101** (tracking offset test point) and **GND** to the chassis.

Oscilloscope setting ---
- Volt : 100mV
- Sweep : 5ms
- Input selector : DC

(2) Turn on the power supply switch of the Player.
(3) Place the test disc **(SZZP1057C . . . Black band disc)** in to the disc holder by open/close button.
(4) After TOC reading, the set will enter the stop mode. Then check the waveform on the oscilloscope and adjust VR103, so that the waveform at **TJ101** is at 0V (**Ground level**) as shown in the illustration.
(5) Turn off the power supply switch of the Player.

D. Provisorische Einstellung von Fokus- und Spurführungsabstand

(Fokusabstand)
(1) CH-1 des Oszilloskops an TJ102 (Fokusabstand-Meßpunkt) und GND (Erdung) an das Gehäuse anschließen.

Oszilloskopeinstellung -----
- Spannung : 100mV
- Ablenkung : 5ms
- Eingangswahlschalter : Gleichstrom

(2) Stromzufuhr zum Gerät einschalten.
(3) Testdisk (SZZP1057C...Schwarzes Band) durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.
(4) Nach erfolgter Ablesung schaltet sich das Gerät ab; Signalform auf dem Oszilloskop überprüfen und VR 105 so einstellen, daß das Signal an TJ102 wie auf der Abbildung auf 0V (Grundlinie) liegt.

(Spurführungsabstand)
(1) CH-1 des Oszilloskops an TJ101 (Meßpunkt für den Spurführungsabstand) und GND (Erdung) an das Gehäuse anschließen.

Oszilloskopeinstellung ---
- Spannung : 100mV
- Ablenkung : 5ms
- Eingangswahlschalter : Gleichstrom

(2) Stromzufuhr zum Gerät einschalten.
(3) Testdisk (SZZP1057C... Schwarzes Band) durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.
(4) Nach erfolgter Ablesung schaltet sich das Gerät ab; Signalform auf dem Oszilloskop überprüfen und VR 103 so einstellen, daß das Signal an TJ101 wie auf der Abbildung auf 0 V (Grundlinie) liegt.
(5) Die Stromzufuhr zum Gerät abschalten.

D. Réglage du décentrement de l'alignement et de la focalisation temporaire

(Décentrement de la focalisation)

(1) Raccorder le canal 1 de l'oscilloscope à TJ102 (point de mesure du décentrement de focalisation) et la mise à la terre au châssis.

Réglage de l'oscilloscope
- Tension : 100mV
- Balayage : 5ms
- Sélecteur d'entrée : C.C.

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.

(3) Installer le disque d'essai (SZZP1057C... Disque à plage noire) dans le dispositif du support pour disque en utilisant la touche d'ouverture/fermeture.

(4) Après lecture de TOC (vérification du décentrement d'alignement), l'appareil sera mis sur le mode d'arrêt. Puis, vérifier la forme d'onde sur l'oscilloscope et régler VR105, de telle sorte que la forme d'onde à TJ102 soit à 0V (niveau de la mise à la terre) comme il est montré sur l'illustration.

(Décentrement de l'alignement)

(1) Raccorder le canal 1 de l'oscilloscope à TJ101 (point de mesure du décentrement de l'alignement) et la mise à la terre au châssis.

Réglage de l'oscilloscope
- Tension : 100mV
- Balayage : 5ms
- Sélecteur d'emtrée : C.C.

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.

(3) Installer le disque d'essai (SZZP1057C... Disque à plage noire) dans le dispositif du support pour disque en utilisant la touche d'ouverture/fermeture.

(4) Après lecture de TOC (vérification du décentrement d'alignement), l'appareil sera mis sur le mode d'arrêt. Puis, vérifier la forme d'onde sur l'oscilloscope et régler VR103 de telle sorte que la forme d'onde à TJ101 soit à 0V (niveau de la mise à la terre) comme il est montré sur l'illustration.

(5) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

D. Ajuste temporal del foco y de descentramiento de pista

(Descentramiento de foco)

(1) Conectar el canal 1 del osciloscopio al TJ102 (Punto de prueba de descentramiento de foco) y TIERRA a la masa (chasis).

Fijación del osciloscopio
- Voltaje : 100mV
- Barrido : 5ms
- Selector de potencia de entrada : CD

(2) Conectar el interruptor de la fuente de energía del tocadiscos.

(3) Poner el disco de prueba (SZZP1057P) ... disco de la banda negra) en el soporte del disco con el botón de abrir/cerrar.

(4) Después de leer TOC, la fijación pasará al modo de paro, verificándose después la forma de onda en el osciloscopio y ajustando VR105 estando la forma de onda en TJ102 (en nivel de TIERRA) como muestra la figura.

(Descentramiento de pista)

(1) Conectar el canal 1 del osciloscopio al TJ101 (Punto de prueba de descentramiento de pista) y TIERRA a la masa.

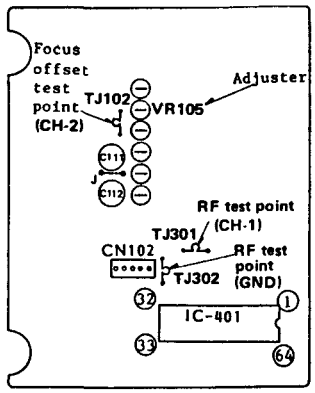
Fijación del osciloscopio
- Voltaje : 100mV
- Barrido : 5ms
- Selector de potencia de entrada : CD

(2) Conectar el interruptor de fuente de energía del tocadiscos.

(3) Poner el disco de prueba (SZZP1057C... Disco de la banda negra) en el soporte del disco con el botón de abrir/cerrar.

(4) Después de leer TOC el juego se pondrá en el modo de paro, verificando luego la forma de onda en el osciloscopio y ajustando VR103 de manera que la forma de onda en TJ101 estando en 0V se pasará al modo de paro (en el nivel de TIERRA) como muestra la figura.

(5) Desconectar el interruptor de la fuente de energía del tocadiscos.



Main PCB

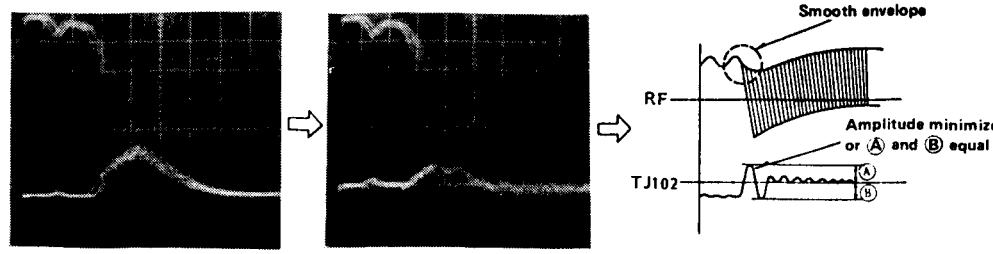


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Fig. 13
Focus offset

E. Focus Offset Adjustment

(1) Connect CH-1 of the oscilloscope to the **TJ301** (RF test point) and CH-2 to the terminal **TJ102.** (Focus offset test point) on the main PCB. **TJ302** of RF test point (GND) on the main PCB as shown in illustration.

		TJ301 (CH-1)	TJ102(CH-2)
Oscilloscope setting	Volt	: 500mV	100mV
	Sweep	: 0.5msec	
	Input Selector	: AC	DC
	Mode	: NORM(Triggering Via CH-1).	

(2) Turn on the power supply switch of the player.
(3) Place the test disc (**SZZP1057C . . . Black band disc**) into the disc holder by open/close button.
(4) The player to the play mode.
(5) Play **TR9** of the test disc.
(6) Check the waveforms of **CH-1** and **CH-2** on the oscilloscope and adjust **VR105** so that the waveform around the triggering point shall be as shown in the illustration.
(7) Turn off the power supply switch of the player.

E. Einstellung des Fokusausgleichs

(1) CH-1 des Oszilloskops an TJ301 (RF-Meßpunkt) und CH-2 an die Klemme TJ102 anschließen (Meßpunkt für Fokusabstand auf der Haupt-Schaltplatte). TJ302 des RF-Meßpunkts (GND) auf der Haupt-Schaltplatte ist wie auf der Abbildung.

		TJ301(CH-1)	TJ102 (CH-2)
Einstellung des Oszilloskops	Spannung	: 500mV	100mV
	Ablenkung	: 0.5 msec.	
	Eingangsumschalter	: Wechselstrom	Gleichstrom
	Betriebsart	: NORM (Auslösung über CH-1)	

(2) Die Stromversorgung des Geräts einschalten.
(3) Testdisk (SZZP1057C...Schwarzes Band) durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.
(4) Das Gerät auf Wiedergabe stellen.
(5) TR (Spur) 9 auf dem Testdisk abspielen.
(6) Signalformen von CH-1 und CH-2 auf dem Oszilloskop überprüfen und VR 105 so einstellen, daß die Signalform um den Auslösepunkt wie auf der Abbildung aussieht.
(7) Die Stromzufuhr zum Gerät abschalten.

E. Réglage du décentrement de focalisation

(1) Raccorder le canal 1 de l'oscilloscope à TJ301 (point de mesure à haute fréquence) et le canal 2 à la borne TJ102 (point de mesure du décentrement de la focalisation) sur la plaquette à circuits imprimés principale.
TJ302 du point de mesure à haute fréquence (terre) sur la plaquette à circuits imprimés principale est tel quil est montré sur l'illustration.

		TJ301 (Canal 1)	TJ102 (Canal 2)
Réglages de l'oscilloscope	Tension	: 500 mV	100 mV
	Balayage	: 0,5msec.	
	Sélecteur d'entrée	: C.A.	C.C.
	Mode	: NORM (Déclenchement via le canal 1)	

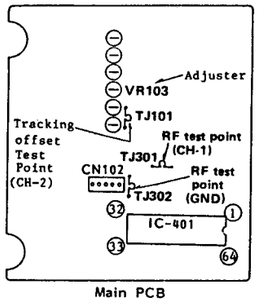
(2) Mettre en marche l'interrupteur d'alimentation du lecteur.
(3) Installer le disque d'essaic (SZZP1057C.. Disque à plage noire) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture.
(4) Régler le lecteur sur le mode d'audition.
(5) Faire jouer la piste 9 du disque d'essai.
(6) Vérifier les formes d'ondes du canal 1 et du canal 2 sur l'oscilloscope et régler VR105 de telle sorte que la forme d'onde autour du point de déclenchement soit telle qu'il est montré sur l'illustration.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

E. Ajuste del desenfoque

(1) Conectar el canal 1 del osciloscopio al TJ301 (Punto de prueba RF) y el canal 1 al terminal TJ101, (Punto de prueba de desenfoque) de la tablilla principal de circuitos impresos.

Fijación del osciloscopio		TJ301(CANAL-1)	TJ102 (CANAL-2)
	Voltaje	: 500mV	100mV
	Barrido	: 0.5msec.	
	Selector de potencia de entrada	: CA	CD
	Modo	: NORM (Disparo vía CANAL-1)	

(2) Encender el interruptor de fuente de energía del tocadiscos.
(3) Poner el disco de pureba (SZZP1057C...el disco de la banda negra) en el soporte del disco con el botón de abrir/cerrar.
(4) El tocadiscos en el modo de audición.
(5) Tocar TR9 del disco de prueba.
(6) Verificar las formas de onda del canal 1 y el canal 2 en el osciloscopio y ajustar VR105 de manera que la forma de onda alrededor del punto de disparo tiene gue estar como muestra la figura.
(7) Apagar el interruptor de la fuente de energía del tocadiscos.



Main PCB

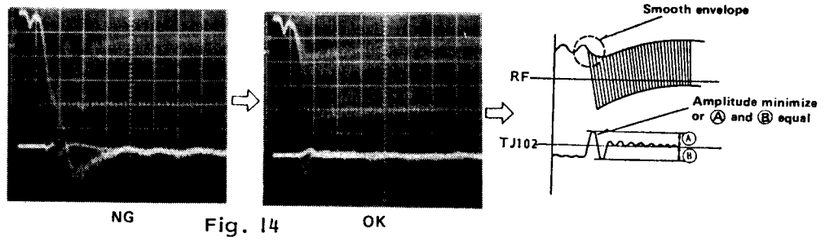


Fig. 14
Tracking offset

F. Tracking Offset Adjustment

(1) Connect CH-1 of the oscilloscope to the **TJ301 (RF test point)** and CH-2 to terminal **TJ101.** (Tracking offset test point)on the main PCB. Connect GND of the oscilloscope to the RF test point (TJ302) on the main PCB as shown in the illustration.

Oscilloscope setting		TJ301 (CH-1)	TJ101(CH-2)
	Volt	: 500mV	100mV
	Sweep	: 0.5msec	
	Input Selector	: AC	DC
	Mode	: NORM(Triggering Via CH-1).	

(2) Turn on the power supply switch of the player.
(3) Place the test disc **(SZZP1057C . . . Black band disc)** into the disc holder.
(4) The player to the play mode.
(5) Play **TR9** of the test disc.
(6) Check CH-1 and CH-2 waveforms displayed on the oscilloscope and adjust **VR103** so that the waveforms shall be as shown in the illustration.
(7) Turn off the power supply switch of the player.

F. Einstellung des Spurausgleichs

(1) CH-1 des Oszilloskops an TJ301 (RF-Meßpunkt) und CH-2 an die Klemme TJ101 (Meßpunkt fur Spurführungs-Abstand) auf der Haupt-Schaltplatte anschließen. GND (Erdung) des Oszilloskops an den RF-Meßpunkt auf der Haupt-Schaltplatte (TJ302) wie in der Abbildung anschließen.

Einstellung des Oszilloskops		TJ301(CH-1)	
	Spannung	: 500 mV	100mV
	Ablenkung	: 0,5 msec.	
	Eingangsumschalter	: Wechselstrom	Gleichstrom
	Betriebsart	: NORM (Auslösung über CH-1)	

(2) Stromversorgung des Geräts einschalten.
(3) Testdisk (SZZP1057C...Schwarzes Band) durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.
(4) Das Gerät auf Wiedergabe stellen.
(5) TR (Spur) 9 auf dem Testdisk abspielen.
(6) Signalformen von CH-1 und CH-2 auf dem Oszilloskop überprüfen und VR103 so einstellen, daß die Signalformen wie auf der Abbildung aussehen.
(7) Stromzufuhr zum Gerät abschalten.

F. Réglage du décentrement d'alignement

(1) Raccorder le canal 1 de l'oscilloscope à TJ301 (point de mesure à haute fréquence) et le canal 2 à la borne TJ101 (point de mesure du décentrement d'alignement) sur la plaquette à circuits imprimés principale.
Raccorder la mise à la terre de l'oscilloscope au point de mesure à haute fréquence (TJ302) sur la plaquette à circuits imprimés principale, comme il est montré sur l'illustration.

Réglages de l'oscilloscope		TJ301 (Canal 1)	TJ101 (Canal 2)
	Tension	: 500 mV	100 mV
	Balayage	: 0,5 msec.	
	Sélecteur d'entrée	: C.A.	C.C.
	Mode	: NORM (Déclenchement via la canal 1)	

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.
(3) Installer le disque d'essai (SZZP1057C...Disque à plage noire) dans le dispositif de support pour disque.
(4) Régler le lecteur sur le mode d'audition.
(5) Faire jouer la piste 9 du disque d'essai.
(6) Vérifier les formes d'ondes du canal 1 et du canal 2 affichées sur l'oscilloscope et régler VR103 de telle sorte que les formes d'ondes soient telles qu'il est montré sur l'illustration.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

F. Ajuste del desvío de trayectoria

(1) Conectar el canal 1 del osciloscopio a TJ301 (Punto de prueba RF) y el canal 2 al terminal TJ101. (Punto de prueba de descentramiento de pista) en la tablilla de circuitos integrados.

Fijación del osciloscopio		TJ301(CANAL-1)	TJ101 (CANAL-2)
	Voltaje	: 400mV	100mV
	Barrido	: 0,5mseg.	
	Selector de potencia de entrada	: CA	CD
	Modo	: NORMA (Disparo vía CANAL-1)	

(2) Encender el interruptor de fuente de energía del tocadiscos.
(3) Poner el disco de prueba (SZZP1057C...disco de la banda negra) en su soporte.
(4) El tocadiscos en el modo de audición.
(5) Tocar TR9 en el disco de prueba.
(6) Verificar las formas de onda de los canales 1 y 2 que se muestran en el oscilador y ajustar VR103 de manera que las formas de onda sean como muestra la figura.
(7) Apagar el interruptor de fuente de energía del tocadiscos.

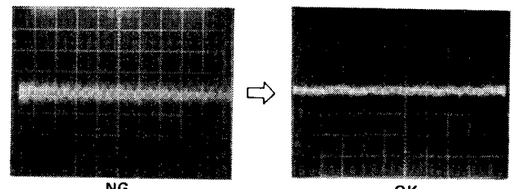


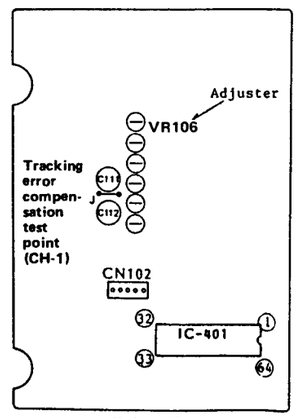
Fig. 15

G. Tracking error Compensation Adjustment

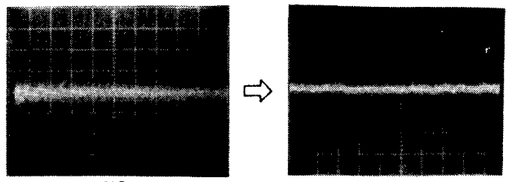
(1) Connect CH-1 of the oscilloscope to the **tracking error compensation test point** (Jumper) and GND to chassis as shown in the illustration.

Oscilloscope setting		
	Volt	: 50mv
	Sweep	: 1ms
	Input selector	: DC

(2) Turn on the power supply switch of the player.
(3) Place the test disc **(SZZP1014F** or **SZZP1054C)** into the disc holder by open/close button.
(4) The player to the play mode.
(5) Play **TR1** of the test disc
(6) Check the waveform on the oscilloscope and adjust **VR106,** so that the waveform at DC level less than **0±5mV** as shown in the illustration.
(7) Turn off the power supply switch of the player.

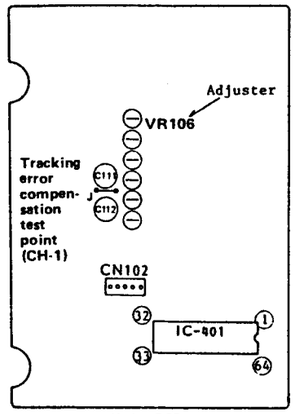


Main PCB



NG OK

Fig. 15



Main PCB

G. Einstellung des Spurfehlerausgleichs

(1) CH-1 des Oszilloskops an den Meßpunkt für Spurfehlerausgleich (Brücke) und GND (Erdung) an das Gehäuse anschließen (s.Abb.).

Einstellung des Oszilloskops---
- Spannung : 50 mV
- Ablenkung : 1ms
- Eingangsumschalter : Gleichstrom

(2) Stromzufuhr zum Gerät einschalten.
(3) Testdisk SZZP1014F oder SZZP1054C durch Betätigung der Auf/Zu-Taste einlegen.
(4) Das Gerát auf Wiedergabe schalten.
(5) TR (Spur) 1 auf dem Testdisk abspielen.
(6) Signalform auf dem Oszilloskop überprüfen und VR 106 so einstellen, daß das Signal des Gleichstroms wie in der Abbildung weniger als 0±5mV beträgt.
(7) Stromzufuhr zum Gerät abschalten.

G. Réglage de la compensation d'erreur d'alignement

(1) Raccorder le canal 1 de l'oscilloscope au point de mesure (jarretière) de compensation d'erreur d'alignement et la mise à la terre au châssis, comme il est montré sur l'illustration.

Réglages de l'oscilloscope ---
- Tension : 50 mV
- Balayage : 1 msec.
- Sélecteur d'entrée : C.C.

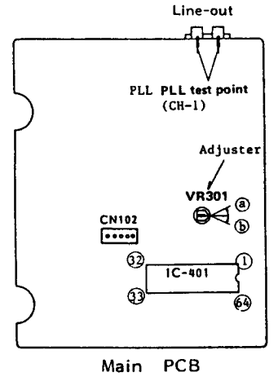
(2) Mettre en marche l'interrupteur d'alimentation du lecteur.
(3) Installer le disque d'essai (SZZP1014F ou SZZP1054C) dans le dispositif du support pour disque en utilisant la touche d'ouverture/fermeture.
(4) Régler le lecteur sur le mode d'audition.
(5) Faire jouer la piste 1 du disque d'essai.
(6) Vérifier la forme d'onde sur l'oscilloscope et régler VR106 de telle sorte que la forme d'onde au niveau C.C. soit inférieure à 0±5mV, comme il est montré sur l'illustration.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

G. Ajuste de compensación de error de pista

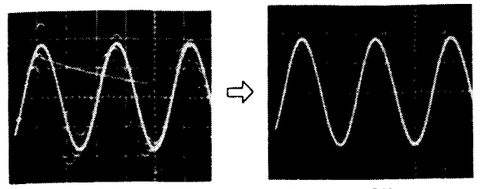
(1) Conectar el canal 1 del oscilador al punto de prueba de compensación de error de pista (puente) y TIERRA a la masa como muestra la figura.

Fijación del osciloscopio --
- Voltaje : 50 mV
- Barrido : 1mseg.
- Selector de potencia de entrada : CD

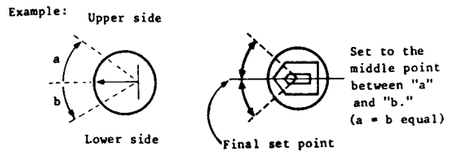
(2) Conectar el interruptor de fuente de energia del tocadiscos.
(3) Poner el disco de prueba (SZZP1014F o SZZP1054C) en el soporte del disco con el botón de cerrar/abrir.
(4) Poner el tocadiscos en el modo de audioreproducción.
(5) Tocar TR1 en el tocadiscos.
(6) Verificar la forma de onda en el osciloscopio, ajustando VR106 de manera que la forma de onda del nivel CD sea menor de 0+5mV como se ve en la figura.
(7) Desconectar el interruptor de fuente de energía del tocadiscos.



Main PCB



NG PLL Fig. 16 OK



H. PLL Adjustment

(1) Connect CH-1 of the oscilloscope to the **line out terminal** (either of L-CH or R-CH) of the main PCB and the terminal GND of the chassis.

Oscilloscope setting ---
- Volt : 1.0V
- Sweep : 1msec.
- Input selector : DC

(2) Turn on the power supply switch of the player.
(3) Place the test disc **(SZZP1054C)** in to the disc holder by open/close key.
(4) The player to the play mode.
(5) Play **Track 7 (WG 0.8mm)** of the test disc.
(6) Check the waveform displayed on the oscilloscope and adjust **VR301** in the following steps.
ⓐ Turn VR301 upwards slowly and learn the point at which the waveform on the oscilloscope begins to be **disturbed** as shown in waveform NG .
ⓑ Turn VR301 downward slowly (opposite direction) and observe the point at which the waveform on the oscilloscope begins to be **disturbed.**
ⓒ **Set VR301 in the middle between the points observed in the above steps "a" and "b".**
(7) Die Stromzufuhr zum Gerät abschalten.

H. PLL-Einstellung

(1) CH-1 des Oszilloskops an die Line out-Klemme (von L-CH oder R-CH) auf der Haupt-Schaltplatte und die GND-Klemme des Gehäuses anschließen.

Einstellung des Oszilloskops---
- Spannung : 1,0V
- Ablenkung : 1ms
- Eingangsumschalter : Gleichstrom

(2) Die Stromversorgung des Geräts einschalten.
(3) Mit dem open/close-Schalter den Testdisk (SZZP1054C) in das Gerät einlegen.
(4) Das Gerät auf Wiedergabe stellen.
(5) TR (Spur) 7 auf dem Testdisk (WG 0,8mm) abspielen.
(6) Die Signalform auf dem Oszilloskop beobachten und VR 301 folgendermaßen einstellen.
ⓐ VR 301 langsam nach oben drehen und dabei auf den Punkt achten, an dem die Signalform wie in der Abbildung NG (falsch) gestört wird.
ⓑ VR 301 langsam nach unten drehen (entgegengesetzt zu a) (oben) und herausfinden, an welchem Punkt die Signalform auf dem Oszilloskop beginnt, gestört zu werden.
ⓒ VR 301 in eine Mittelposition zwischen den Punkten aus den Schritten a) und b) einstellen.

H. Réglage du circuit d'asservissement de phase

(1) Raccorder le canal 1 de l'oscilloscope à la borne de sortie de ligne (soit au canal de gauche soit au canal de droite) de la plaquette à circuits imprimés principale et à la borne de mise à la terre du châssis.

Réglages de l'oscilloscope ---
- Tension : 1,0 V
- Balayage : 1 msec.
- Sélecteur d'entrée : C.C.

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.
(3) Placer le disque d'essai (SZZP1054C) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture.
(4) Régler le lecteur sur le mode d'audition.
(5) Faire jouer la piste 7 du disque d'essai (coin de 0,8 mm).
(6) Vérifier la forme d'onde affichée sur l'oscilloscope et régler VR301 selon les étapes suivantes.
ⓐ Tourner lentement VR301 vers le haut et observer le point où la forme d'onde sur l'oscilloscope commence à être perturbée, comme il est montré sur la forme d'onde NG (incorrect).
ⓑ Tourner lentement vers le bas VR301 (dans la direction opposée) et observer le point où la forme s'onde sur l'oscilloscope commence à être perturbée.
ⓒ Régler VR301 au milieu, entre les points observés aux étapes "a" et "b" ci-dessus.

H. Ajuste PLL

(1) Conectar el canal 1 del osciloscopio al terminal de la línea de salida (canal de la izquierda o de la derecha) de la tablilla principal de circuítos impresos y el terminal de TIERRA a masa.

Fijación del osciloscopio --
- Voltaje : 1,0 V
- Barrido : 1mseg.
- Selector de potencia de entrada: CD

(2) Encender el interruptor de fuente de energia del tocadiscos.
(3) Poner el disco de prueba (SZZP1054C) en su soporte con la llave de abierto/cerrado.
(4) El todaciscos en el modo de audición.
(5) Tocal la pista 7 (WG 0,8mm) del disco de prueba.
(6) Verificar la forma de onda que se muestra en el osciloscopio y ajustar VR 301 (resistencia variable) en los siguientes pasos.
ⓐ Girar poco a poco hacia arriba VR301 y observar el punto en que la forma de onda del osciloscopio comienza a disturbarse como muestra la forma de onda NG ,
ⓑ Hacer girar VR301 hacia abajo poco a poco (en dirección contraria) y tomar nota del punto en que la forma de onda en el osciloscopio comienza a deformarse. opio comienza a defor-
ⓒ Fijar VR 301 en el punto medio entre los dos anotados en los pasos arriba mencionados "a" y "b".
(7) Apagar el interruptor de la fuente de energía del tocadiscos.

Technics Test Disc "SZZP1054C"	
Track number 12	0.6mm Wedge
Track number 13	0.7mm Wedge
Track number 5	0.6mm Black spot
Track number 6	0.7mm Black spot

I. Check of play operation after adjustment

(1) Check of skip search
  1) Play an ordinary disc.
  2) Press the skip button and check to see that the skip search functions (Forward and reverse)

(2) Check of manual search
  1) Play an ordinary disc.
  2) Press the manual search button and check to see that smooth manual search can be done at low and high speeds (Forward and reverse)

(3) Check to make sure the best adjusted condition for defects.
  1) Play the Technics test disc "SZZP1054C".
  2) Play the track 12 (Wedge 0.6 mm), track 13 (Wedge 0.7mm), and see that there is no sound skip or noise.
  3) Play the tracks (Black spot 0.6mm), track 6 (Black spot 0.7mm) and see that there is no sound skip or noise.

I. Vérification du fonctionnement de l'audition après le réglagle

(1) Vérification de la recherche par sauts :
  1. Faire jouer un disque normal.
  2. Appuyer sur les touches de saut et vérifier si la recherche par sauts fonctionne (vers l'avant et vers l'arrière).

(2) Vérification de la recherche manuelle:
  1. Faire jouer un disque normal.
  2. Appuyer sur la touche de recherche manuelle et vérifier si une recherche manuelle (vers l'avant et vers l'arrière) aisée et sans à-coups peut être effectuée à des vitesses faibles et élevées.

(3) Vérifier pour s'assurer des conditions de réglage les meilleures pour localiser les défauts.
  1) Faire jouer le disque d'essai Technics "SZZP1054C".
  2) Faire jouer la piste 12 (coin de 0,6 mm) et la piste 13 (coin de 0,7 mm), et vérifier qu'il n'y ait pas de zones de silence ou de bruit.
  3) Faire jouer la piste 5 (zone d'interférence de 0,6 mm) et la piste 6 (zone d'interférence de 0,7 mm) et vérifier qu'il n'y ait pas de zones de silence ou de bruit.

I. Überprüfung der Wiedergabe nach der Einstellung

(1) Überprüfung der autom. Liedanfang-Suche:
  1. Einen normalen Disk abspielen.
  2. Suchknopf drücken und vergewissern, daß die Suche durchgeführt wird. (Vorwärts und rückwärts).

(2) Überprüfung der manuellen Liedanfang-Suche:
  1. Einen normalen Disk spielen.
  2. Handsuchknopf drücken und vergewissern, daß die manuelle Suche bei hoher und normaler Geschwindigkeit reibungslos abläuft. (Vorwärts und rückwärts)

(3) Die optimale Einstellung im Falle von Störungen herausfinden.
  1) Technics Testdisk "SZZP1054C" abspielen.
  2) Spur 12 (Keil 0,6mm) und Spur 13 (Keil 0,7mm) abspielen und darauf achten, daß nichts übersprungen wird und daß kein Geräusch auftritt.
  3) Spur 5 (schwarzer Fleck 0,6mm) und Spur 6 (schwarzer Fleck 0,7mm) abspielen und darauf achten, daß nichts übersprungen wird und daß kein Geräusch auftritt.

I. Verificación de la operación de audición después del ajuste

(1) Verificación del salto de rastreo:
  1. Tocar una disqueta ordinaria.
  2. Presionar el botón de salto (silencio) y verificar si ocurre el salto de rastreo. (De avance y retroceso).

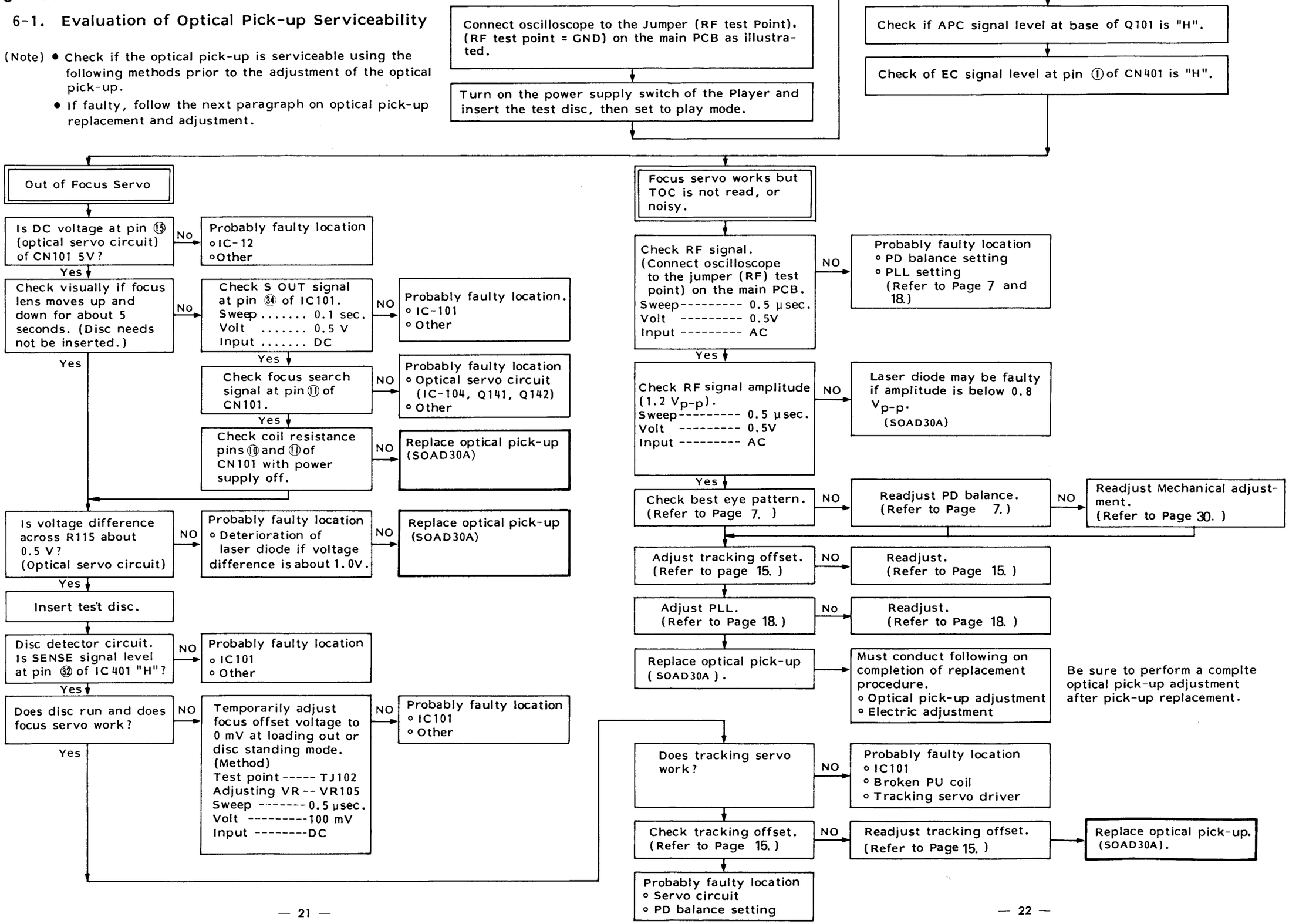
(2) Verificación del rastreo manual:
  1. Tocar una disqueta ordinaria.
  2. Presionar el botón de rastreo manual y comprobar si se realiza suavemente el rastreo manual a velocidades bajas y altas (De aavance y retroceso).

(3) Verificar y asegurarse que se ha ajustado sin ningún defecto.
  1) Tocar el disco de prueba de Technics "SZZP1054C"
  2) Tocar la pista 12 (Desplazamiento 0,6mm), la pista 12 (Desplazamiento 0,7mm), viendo si hay saltos de sonido o ruído.
  3) Tocas las pistas (Punto negro 0,6mm), la pista 6 (punto negro 0,7mm) viendo si hay saltos de sonido o ruído.

6. OPTICAL PICK-UP ADJUSTMENT

6-1. Evaluation of Optical Pick-up Serviceability

(Note) • Check if the optical pick-up is serviceable using the following methods prior to the adjustment of the optical pick-up.
• If faulty, follow the next paragraph on optical pick-up replacement and adjustment.


Connect oscilloscope to the Jumper (RF test Point). (RF test point = GND) on the main PCB as illustrated.
Turn on the power supply switch of the Player and insert the test disc, then set to play mode.
Check if APC signal level at base of Q101 is "H".
Check of EC signal level at pin ⑪ of CN401 is "H".
Out of Focus Servo
Is DC voltage at pin ⑮ (optical servo circuit) of CN101 5V?
No
Probably faulty location
∘IC-12
∘Other
Yes
Check visually if focus lens moves up and down for about 5 seconds. (Disc needs not be inserted.)
No
Check S OUT signal at pin ㉞ of IC101.
Sweep ..... 0.1 sec.
Volt ..... 0.5 V
Input ..... DC
NO
Probably faulty location.
∘ IC-101
∘ Other
Yes
Check focus search signal at pin ⑪ of CN101.
NO
Probably faulty location
∘ Optical servo circuit (IC-104, Q141, Q142)
∘ Other
Yes
Check coil resistance pins ⑩ and ⑪ of CN101 with power supply off.
NO
Replace optical pick-up (SOAD30A)
Yes
Is voltage difference across R115 about 0.5 V? (Optical servo circuit)
NO
Probably faulty location
∘ Deterioration of laser diode if voltage difference is about 1.0V.
NO
Replace optical pick-up (SOAD30A)
Yes
Insert test disc.
Disc detector circuit. Is SENSE signal level at pin ㉜ of IC401 "H"?
NO
Probably faulty location
∘ IC101
∘ Other
Yes
Does disc run and does focus servo work?
NO
Temporarily adjust focus offset voltage to 0 mV at loading out or disc standing mode.
(Method)
Test point ----- TJ102
Adjusting VR -- VR105
Sweep ------- 0.5 µsec.
Volt --------- 100 mV
Input -------- DC
NO
Probably faulty location
∘ IC101
∘ Other
Yes
Focus servo works but TOC is not read, or noisy.
Check RF signal. (Connect oscilloscope to the jumper (RF) test point) on the main PCB.
Sweep--------- 0.5 µsec.
Volt --------- 0.5V
Input --------- AC
NO
Probably faulty location
∘ PD balance setting
∘ PLL setting
(Refer to Page 7 and 18.)
Yes
Check RF signal amplitude (1.2 Vp-p).
Sweep--------- 0.5 µsec.
Volt --------- 0.5V
Input --------- AC
NO
Laser diode may be faulty if amplitude is below 0.8 Vp-p.
(SOAD30A)
Yes
Check best eye pattern. (Refer to Page 7.)
NO
Readjust PD balance. (Refer to Page 7.)
NO
Readjust Mechanical adjustment. (Refer to Page 30.)
Adjust tracking offset. (Refer to page 15.)
NO
Readjust. (Refer to Page 15.)
Adjust PLL. (Refer to Page 18.)
No
Readjust. (Refer to Page 18.)
Replace optical pick-up (SOAD30A).
Must conduct following on completion of replacement procedure.
∘ Optical pick-up adjustment
∘ Electric adjustment
Be sure to perform a complte optical pick-up adjustment after pick-up replacement.
Does tracking servo work?
NO
Probably faulty location
∘ IC101
∘ Broken PU coil
∘ Tracking servo driver
Check tracking offset. (Refer to Page 15.)
NO
Readjust tracking offset. (Refer to Page 15.)
Replace optical pick-up. (SOAD30A).
Probably faulty location
∘ Servo circuit
∘ PD balance setting

6-2. How to Service Optical Pick-up
6-2. Wartung des Optischen Abnehmers
6-2. Comment reparer la tete de Lecture Optique
6-2. Como Funciona el Captador Optico

ENGLISH

The laser diode in the optical pick-up may be damaged by potential difference caused by static charge on clothing or body. Pay careful attention to damage by static charge when repaired.

DEUTSCH

Die Laserdiode im optischen Abnehmer kann durch Spannungsunterschiede, die durch statische Aufladung der Kleidung oder des Körpers entstehen können, beschädigt werden. Bei Reparaturen ist es geraten, mögliche Schäden durch statische Aufladung zu verhindern.

FRANÇAIS

La diode laser installée dans la tête de lecture optique risque d'être endommagée par la différence de potentiel provoquée par la charge statique sur les vêtemenst ou le corps. Lorsqu'on répare, prendre garde à une éventuelle détérioration causée par la charge statique.

ESPAÑOL

El diodo de láser en el captador óptico puede ser dañado por una diferencia de potencial causada por una carga estática o parásita de la ropa o el cuerpo. Tener mucho cuidado de no dañarlo con corriente parásita al repararlo.

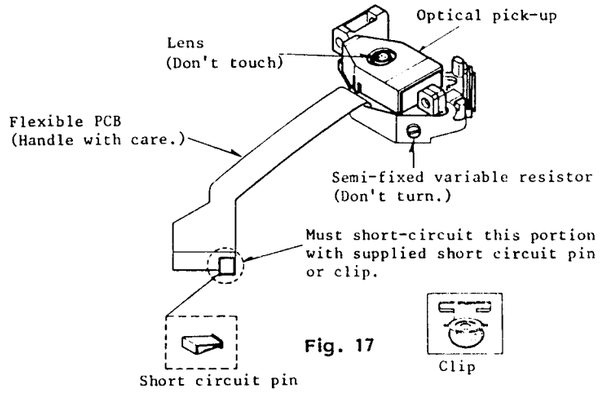


Fig. 17

ENGLISH

■ Handling of Optical Pick-up

1. Don't give a heavy shock to the optical pick-up which is very precisely constructed.
2. A charge prevention pin is inserted in the flexible PCB for preventing damage to the laser diode. The shorting pin must not be removed for more than a few seconds at any time.
3. Handle the flexible PCB with care because PCB may be cut if an excessive stress is applied. applied.
4. Do not turn the laser power adjustment variable resistor. It has already been adjusted at the factory.

DEUTSCH

■ Handhabung des optischen Abnehmers

1. Der optische Abnehmer ist ein Präzisionsinstrument, das keinen schweren Erschütterungen ausgesetzt werden sollte.
2. An der biegsamen Schaltplatte ist ein Kontakt angebracht, der die Laserdiode vor Beschädigung durch statische Aufladung schützt. Der Kurzschlußkontakt muß so schnell wie möglich aus-und eingebaut werden.
3. Die biegsame Schaltplatte sollte behutsam behandelt werden, da sie keine größeren Belastungen verträgt.
4. Der Regelwiderstand für die Leistung des Lasers ist vor dem Versand eingestellt worden und sollte belassen werden, wie er ist.

FRANÇAIS

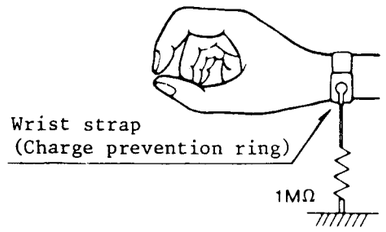
■ Manipulation de la tête de lecture optique

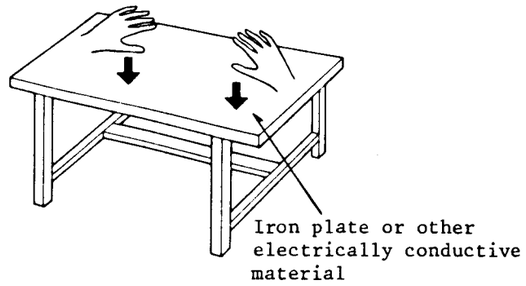
1. Ne pas donner de fortes secousses à la tête de lecture optique dont le montage est d'une grande précision.
2. Une broche neutralisatrice de charge est insérée dans la plaquette à circuits imprimés flexible pour éviter l'endommagement de la diode laser. La broche de court-circuitage ne devar pas être retirée pendant plus de quelques secondes à n'importe quel moment.
3. Manipuler la plaquette à circuits imprimés flexible avec précaution car elle risque d'être sectionnée si une tension excessive y est appliquée.
4. Ne pas tourner la résistance variable du réglage d'énergie du laser. Elle a déjà été réglée à l'usine.

ESPAÑOL

■ Manejo del captador óptico

1. Evitar los golpes en el captador óptico, que es un instrumento de gran precisión.
2. Para evitar daños en el diodo de láser, hay una grapa protectora en la TCI flexible. La grapa se debe poner o quitar en el tiempo más corto posible.
3. Manejar con cuidado la TCI flexible, porque podría cortarse al aplicarle tensión excesiva.
4. No tocar la RV de ajuste de láser, que ya está ajustado antes del envío.





ENGLISH

■ Grounding to Prevent Static Charge Damage

1. Body Grounding: Put on the charge preventing wrist strap for discharging electricity from the body.
2. Working Table Grounding: Lay electrically conductive material (conductive sheet) or an iron plate on the table where the optical pick-up is placed, and ground the material or sheet to the floor.

Note: Static charge of clothing is not discharged from the wrist strap. Exercise care so that clothing does not touch the wrist strap.

FRANÇAIS

■ Mise à la terre pour éviter une détérioration de la charge statique.

1. Mise à la terre du corps:
   Installer une attache neutralisatrice de charge au poignet pour le déchargement de l'électricité provenant du corps.
2. Mise à la terre de la table de travail:
   Installer un matériau électriquement conductif (plaque conductible) ou une plaque de fer sur la table où la tête de lecture optique est placée et relier à la terre le matériau ou la plaque.

Nota: La charge statique des vêtements n'est pas déchargée de l'attache du poignet. On devra donc prendre garde à ce que les vêtements ne touchent pas l'attache du poignet.

DEUTSCH

■ Erdung zur Verhütung von Schäden durch statische Aufladung

1. Körpererdung :
   Legen Sie das Armband um, das Elektrizität aus dem Korper entlädt.
2. Arbeitstischerdung :
   Legen Sie elektrisch leitfähiges Material (Folie) oder eine Metallplatte auf dem Tisch aus, auf den der optische Abnehmer gelegt wird, und erden Sie das Material oder die Folie.

Hinweis: Ladungselektrizität der Kleidung wird vom Armband nicht entladen. Seien Sie vorsichtig, daß Ihre Kleidung das Arband nicht berührt.

ESPAÑOL

■ Torque con la tierra para impedir carga estática.

1. Contacto del cuerpo con tierra:
   Para la descarga de la electricidad estática del cuerpo, ponerse la banda pulsera.
2. Contacto del banco de trabajo con tierra:
   Poner sobre el banco de trabajo un material conductor (tapete conductor) o una placa metálica donde se ha de colocar el captador óptico, conectando con tierra el material conductor.

Nota: Carga estatica de vestidos no se descarga de la faja de pulsera. Tener cuidado para que la faja de pulsera no se torque con vestidos.

7. OPTICAL PICK-UP REPLACEMENT PROCEDURE

Note: Exercise care so that disassembled parts are not lost.
Prepare the player for service under power as shown in the illustration follow the disassembly procedure outlined in the service manual.

(1) Remove the front panel.
(2) Pushing the two stopper pawls of the disc holder inward simultaneously, pull the holder to remove it.
(3) Remove the resisting plate for the position detector.

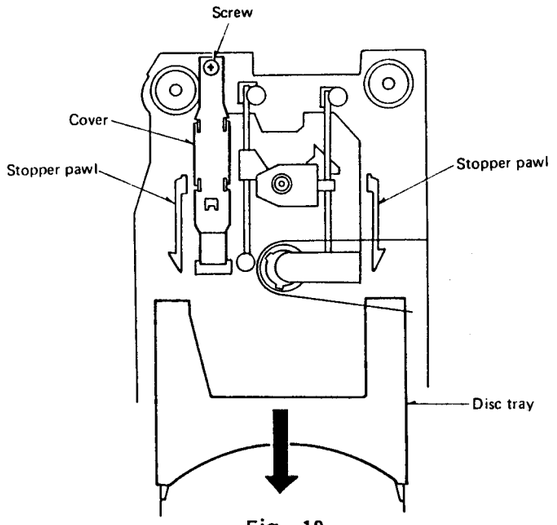
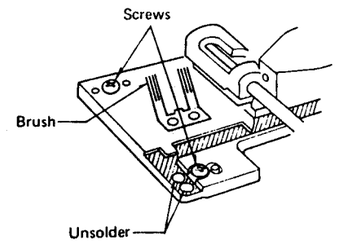


Fig. 19

(4) Unsolder the linear motor drive coil and optical pick-up to separate them.
(5) Remove the two linear motor drive coil fastening screws.
Note: Handle the contact brush carefully.



(6) Disconnect the optical pick-up 17-pin flexible cord from connector CN101 on the main PCB.
Note: 1. Pull out the connector at the point indicated by the arrow.
2. Pull out the flexible cord.

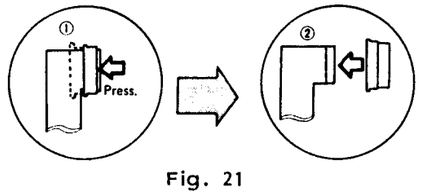


Fig. 21

(7) Remove the three optical pick-up fastening screws.
(8) Remove the optical pick-up fastening shaft.
Note: Be careful not to lose or misplace the cushion rubber.
(9) The optical pick-up has now been completely separated.
It is not necessary to remove the traverse unit as before. If the unit needs to be removed, pay attention to the four springs. (See page 20 Fig. 24)

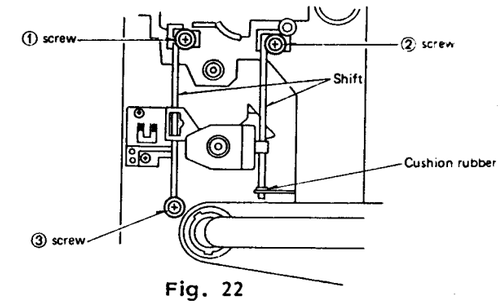


Fig. 22

(10) Remove the linear motor coil fastening bracket.

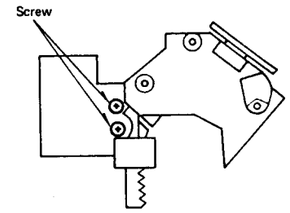


Fig. 23

(11) Install the optical pick-up in the reverse order of disassembly so that Power On Check can be conducted. Refer to the illustrations.

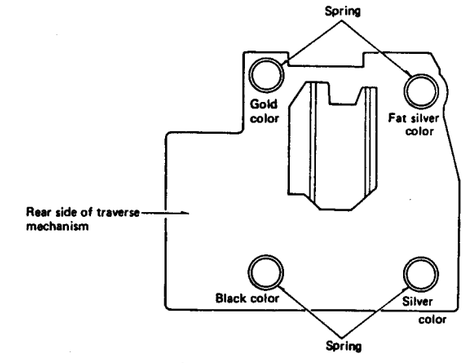


Fig. 24 Front side

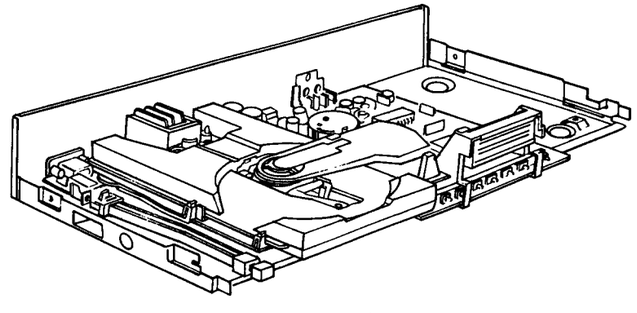


Fig. 25 Power ON check status

8. ADJUSTING PROCEDURE OF OPTICAL PICK-UP
8. EINSTELLUNG DES OPTISCHEN ABNEHMERS
8. PROCEDURE DE RÉGLAGE DE LA TÊTE DE LECTURE OPTIQUE
8. PROCEDIMIENTO DE AJUSTE DEL CAPTADOR OPTICO

8-1. Adjusting steps and Points of optical pick-up
8-1. Schritte und Vorgänge bei der Einstellung des optischen Abnehmers
8-1. Points et étapes du réglage de la tête de lecture optique
8-1. Pasos del ajuste y puntos del captador óptico

- Set up player according to disassembly procedure so that power-on check can be conducted.
- Regelwiderstände auf der Haupt-Schaltplatte wie in der Abbildung gezeigt provisorisch einstellen.
- Monter l'appareil selon la procédure inverse du démontage de telle sorte qu'une vérifiaction de mise sous tension puisse être effectuée.
- Fijar el tocadiscos para el proceso de desarmado de forma que se pueda hacer la verificación del contacto con la fuente de energía

- Temporarily set variable resistors on main PCB as shown.
- Regelwiderstände provisorisch an die Servo-Schaltplatte legen.
- Régler temporairement les résistances variables sur la plaquette à circuits imprimés principale comme il est illustré.
- Ajustar temporalmente las resistencias variables de la TCI de servo.

- Adjust turntable height.
- Drehtellerhöhe einstellen.
- Hauteur de réglage de la platine
- Ajustar la altura del plato giratorio.

- Mechanical adjustment
- Mechanische Einstellung
- Réglage mécanique
- Ajuste mecánico.

- Electric adjustment
- Elektrische Einstellung
- Réglage électrique
- Ajuste eléctrico.

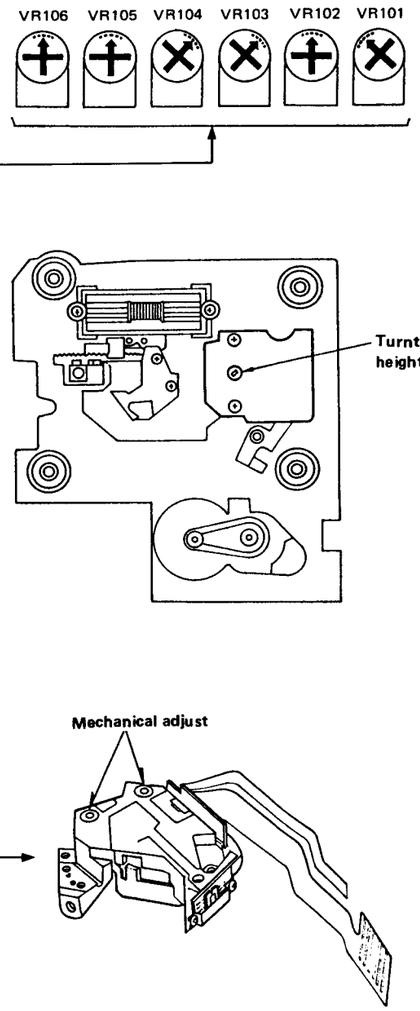


Fig. 26

8-2. Required Measuring Instruments and Tools

1. Two-channel oscilloscope (with external trigger), over 30 MHz.
2. Test disc (SZZP1014F) or (SZZP1054C)
3. Hexagonal wrench--------1.5 mm (SZZP1044C)
4. General tools

8-2. Erforderliche Instrumente und Werkzeuge

1. 2-Kanal Oszilloskop (mit externem Auslöser) über 30 MHz.
2. Testdisk SZZP1014F oder SZZP1054C
3. Inbus-Schlüssel ---------1,5mm (SZZP1044C)
4. Allgemein übliche Werkzeuge

8-2. Appareils et outils de mesurage requis

1. Oscilloscope à double canal (avec déclenchement extérieur); plus de 30 MHz.
2. Disque d'essai (SZZP1014F) ou (SZZP1054C).
3. Clé hexagonale ----------1,5mm (SZZP1044C)
4. Outils généraux

8-2. Pasos y puntos de ajuste del captador óptico

1. Osciloscopio de dos canales (con disparo exterior), de más de 30 MHz.
2. Disco de prueba (SZZP1014F) o (SZZP1054C).
3. Llave allen ----------1,5mm (SZZP1044C)
4. Herramientas generales

9. MECHANICAL ADJUSTMENT PROCEDURE
9. MECHANISCHER EINSTELLVORGANG
9. PROCÉDURE POUR LA MISE AU POINT MÉCANIQUE
9. PROCEDIMIENTO DEL AJUSTE MECANICO

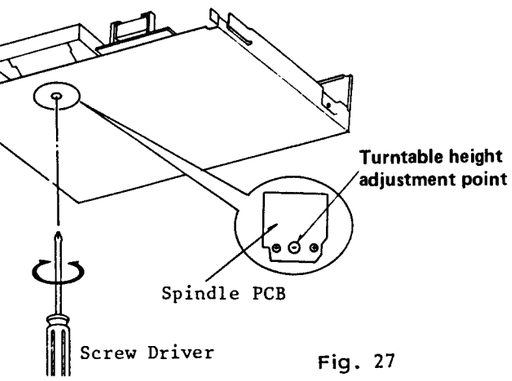
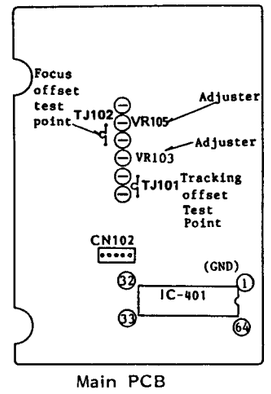
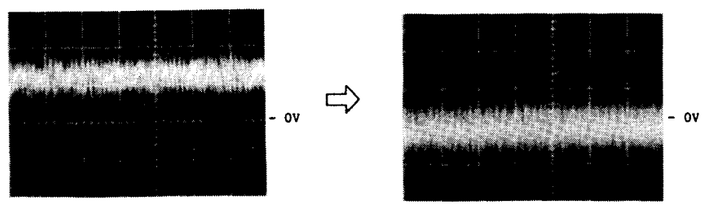


Fig. 27



Main PCB



NG Fig. 28 OK

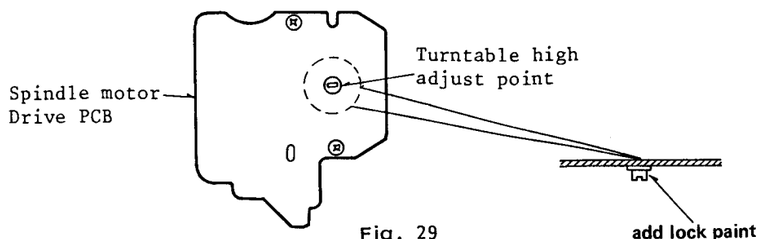


Fig. 29

A. Turn Table Height Adjustment

(1) Turn on the power supply switch of the player.

(2) Place the test disc (SZZP1014F) or (SZZP1054C) into the disc holder.

(3) Turn off the power supply switch of the player.

(4) Set the oscilloscope to DC zero balance.

(5) Connect the CH-1 of the oscilloscope to TJ102 of the servo circuit and GND to the chassis.

Oscilloscope settings --
- Sweep : 5m sec.
- Volt : 100mV
- Input selector : DC

(6) Turn on the power supply switch of the player.

(7) Play back a desired track.

(8) Place the unit in the corner of the workbench -- in the place that allows the adjustment -- and prepare as illustrated.
Do not jar or jolt the unit.

(9) Turn the adjusting screw on the underside of the spindle motor PCB with a flat screwdriver so that the waveform at TJ102 is 0 ± 50mV, as shown in the illustration.

(10) Turn off the power supply switch of the player.

(11) Lock the adjusting screw with "Screw lock paint (RZZ0L01)" on completion of adjustment.

A. Réglage de la hauteur de la platine

(1) Mettre en marche l'interrupteur d'alimentation de l'appareil.

(2) Installer le disque d'essai (SZZP1014F) ou (SZZP1054C) dans le dispositif de support pour disque.

(3) Mettre hors tension l'interrupteur d'alimentation de l'appareil.

(4) Régler l'oscilloscope avec un équilibrage sur zéro C.C.

(5) Raccorder le canal 1 de l'oscilloscope à TJ102 du circuit d'asservissement et GND (mise à la terre) au châssis.

Réglages de l'oscilloscope
- Balayage : 5 msec.
- Tension : 100 mV
- Sélecteur d'entrée : C.C.

(6) Mettre en marche l'interrupteur d'alimentation de l'appareil.

(7) Faire jouer la piste désirée.

(8) Placer l'appareil au coin d'un établi -- à l'endroit qui vous permettra d'effectuer la mise au point -- et préparer comme il est illustré. Ne pas heurter ou donner de secousses à l'appareil.

(9) Tourner la vis de réglage située sur la face inférieure de la plaquette à circuits imprimés du moteur à pivot avec un tournevis à lame plate de telle sorte que la forme d'onde à TJ102 soit de 0 ± 50 mV, comme il est montré sur l'illustration.

(10) Mettre hors tension l'interrupteur d'alimentation de l'appareil.

(11) Bloquer la vis de réglage avec une peinture pour blocage de vis (RZZ0L01)" une fois achevée la mise au point.

A. Einstellung der Drehtellerhöhe

(1) Stromversorgung des Geräts einschalten.

(2) Testdisk SZZP1014F oder SZZP1054C einlegen.

(3) Stromversorgung des Geräts abschalten.

(4) Das Oszilloskop wie unten beschrieben einstellen.

(5) CH-1 des Oszilloskops an TJ 102 des Servo-Schaltkreises und GND (Erdung) des Gehäuses anschließen.

Einstellung des Oszilloskops
- Ablenkung : 5ms
- Spannung : 100mV
- Eingangsumschalter : Gleichstrom

(6) Stromzufuhr zum Gerät einschalten.

(7) Gewünschte Spur abspielen.

(8) Das Gerät auf der Stelle der Werkbank, die für die Einstellung geeignet ist, anbringen und vorsichtig damit umgehen, ohne es zu erschüttern.

(9) Die Einstellschraube an der Unterseite des Wellenmotor-Kontakts mit einem flachen Schraubenzieher so drehen, daß die Signalform wie in Abb. 5-3 bei TJ 102 0 ± 50mV beträgt.

(10) Die Stromzufuhr zum Gerät abschalten.

(11) Die Enstellschraube nach erfolgter Einstellung mit "Arretierlack (RZZ0L01)" fixieren.

A. Ajuste de la altura del plato giratorio

(1) Encender el interruptor de fuente de energía del tocadiscos.

(2) Poner el disco de prueba (SZZP1014F) o (SZZP1054C) en el soporte del disco.

(3) Encender el interruptor de fuente de energia del tocadiscos.

(4) Fijar el osciloscopio en el balance cero de CD.

(5) Conectar el CANAL-1 del osciloscopio a TJ102 del circuíto de servo y TIERRA al chassis.

Fijaciones del osciloscopio
- Barrido : 5m
- Voltaje : 100mV
- Selector de potencia de entrada : CD

(6) Encender el interruptor de la fuente de energía del tocadiscos.

(7) Tocar algo en la pista que se desee.

(8) Poner la unidad en la esquina del banco de trabajo --- en un lugar que se avenga al ajuste--preparándolo tal como muestra la figura con cuidado de no agitarlo o golpearlo.

(9) Hacer girar el tornillo de fijación en la parte baja de la TCI del motor de vástago con un destorniliador plano hasta que la forma de onda en TJ102 sea ± 50mV como se muestra en la Fig. 5-3.

(10) Encender el interruptor de la fuente de energía del tocadiscos.

(11) Asegurar el tornillo de ajuste con "pintura aseguradora (RZZ0L01)" al completar el ajuste.

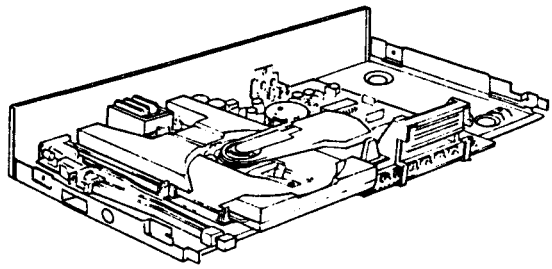
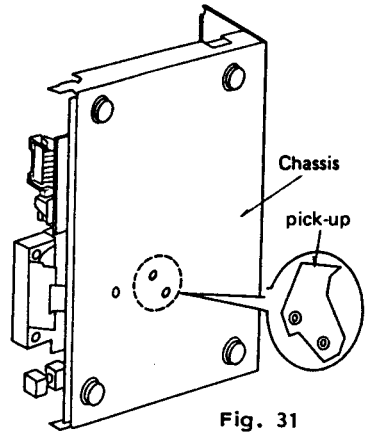


Fig. 30



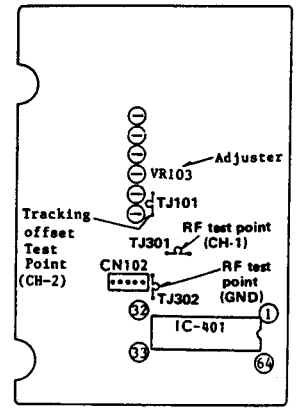
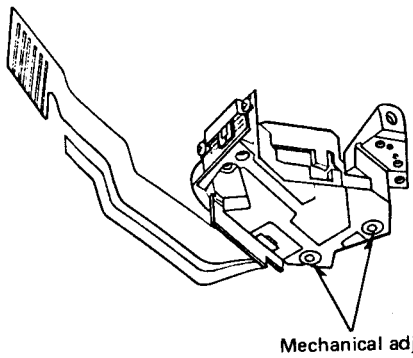
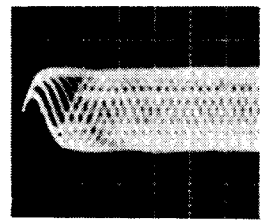


Fig. 31

Main PCB



NG



"OK"

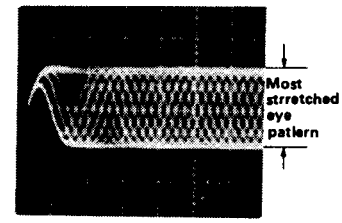


Fig. 32

B. Mechanical Adjustment

(1) Turn on the power supply switch of the player.

(2) Insert the test disc (SZZP1056C) in the disc holder.

(3) Turn off the power supply switch of the player.

(4) Set the oscilloscope as stated below.

Oscilloscope settings		
	Sweep	: 0.5 µsec.
	Volt	: 0.5V
	Input selector	: AC

(5) Connect CH-1 of the oscilloscope to TJ301 of RF test point and GPD to TJ302 of RF test point (GND).

(6) Turn on the power supply switch of the player.

(7) Play back TR9.

Note: If any track other than TR9 is played back, this adjustment cannot be achieved. If the temporary adjustment takes much time, it is advisable to set the player in the repeat mode.

(8) Set the player in the playback mode as shown in the illustration. Do not jar or jolt the unit.

(9) Keeping the player in the playback mode, place it as illustrated (stand it on its left side).
Note : If the player is stood on its right side, the adjustment cannot be made properly.

(10) Check if the RF signal waveform is as shown in the illustration (NG). If the waveform can not be checked or is unlike the given waveform, proceed to the following steps.

(11) Set the allen wrench (SZZP1044C. . .1.5mm) into the socket in the heads of the mechanical adjusting screws shown in the illustration and turn the both screws right or left to optimum positions.

(12) Turn off the power supply switch of the player.

(13) Lock both adjusting screw with screw lock paint (RZZ0L01) on completion of adjustment.

B. Mechanische Einstellung

(1) Stromversorgung des Geräts einschalten.
(2) Testdisk (SZZP1056C) in den Halter einlegen.
(3) Stromversorgung des Geräts abschalten.
(4) Das Oszilloskop wie unten beschrieben einstellen.

Einstellung des Oszilloskops		
	Ablenkung	: 0,5µs
	Spannung	: 0,5V
	Eingangsumschalter	: Wechselstrom

(5) CH-1 des Oszilloskops an TJ301 des RF-Meßpunkts und PGD an TJ301 des RF-Meßpunkts und GPD an TJ302 des RF-Meßpunkts (GND) anschließen.
(6) Stromversorgung des Geräts einschalten.
(7) TR6 abspielen.
(8) Das Gerät wie in der Abbildung auf Wiedergabe schalten und dabei aufpassen, daß es nicht erschüttert wird.

(9) Das auf Wiedergabe geschaltete Gerät wie in der Abbildung plazieren (auf seine linke Seite stellen).
Hinweis: Wenn das Gerät auf die rechte Seite gestellt wird, kann die Einstellung nicht optimal durchgeführt werden.
(10) Darauf achten, ob die RF-Signalform wie in der Abbildung (NG=falsch) aussieht. Falls sie nicht überprüft werden kann oder von der gegebenen Form abweicht, wie in den folgenden Schritten vorgehen.
(11) Sechskantschlüssel (SZZP1044C...1,5mm) wie in der Abbildung gezeigt in die Vertiefungen der Einstellschrauben einsetzen und beide Schrauben bis zur optimalen Einstellung nach rechts und links drehen.
(12) Stromzufuhr zum Gerät abschalten.
(13) Beide Schrauben nach erfolgter Einstellung mit Arretierlack (RZZ0L01) fixieren.

B. Réglage mécanique

(1) Mettre en marche l'interrupteur d'alimentation de l'appareil.
(2) Intaller le disque d'essai (SZZP1056C) dans le dispositif de support pour disque.
(3) Mettre hors tension l'interrupteur d'alimentation de l'appareil.
(4) Régler l'oscilloscope comme il est indiqué ci-dessous.

Réglages de l'oscilloscope	Balayage	:	0,5 µsec.
	Tension	:	0,5 V
	Sélecteur d'entrée	:	C.A.

(5) Raccorder le canal 1 de l'oscilloscope à TJ301 du point de mesure de haute fréquence et la mise à la terre à TJ302 du point de mesure de haute fréquence (masse).
(6) Mettre en marche l'interrupteur d'alimentation de l'appareil.
(7) Faire jouer la piste 6.
(8) Régler le lecteur sur le mode de lecture, comme il est montré sur l'illustration. Ne pas heurter ou donner de secousses à l'appareil.
(9) Tout en laissant le lecteur sur le mode de lecture, l'installer comme il est illustré (le déposer sur son côté gauche).
Nota: Si le lecteur est placé sur le côté droit, le réglage ne pourra être effectué correctement.
(10) Vérifier si la forme d'onde du signal de haute fréquence est telle qu'elle est montrée sur l'illustration (NG: incorrect). Si la forme d'onde ne peut être vérifiée ou si elle est différente de la forme d'onde donnée, procéder selon les étapes suivantes.
(11) Placer la clé hexagonale (SZZP1044C...1,5mm) dans l'alvéole des têtes des vis de réglage mécanique comme il est montré sur l'illustration et tourner les deux vis de droite et de gauche aux positions optimales.
(12) Mettre hors circuit l'interrupteur d'alimentation du lecteur.
(13) Bloquer les deux vis de réglage avec une peinture pour blocage de vis (RZZ0L01) une fois achevée la mise au point.

B. Ajuste mecánico

(1) Encender el interruptor de la fuente de energía del tocadiscos.
(2) Poner la disqueta de prueba (SZZP1056C) en su soporte.
(3) Apagar el interruptor de la fuente de energía del tocadiscos.
(4) Fijar el oscilozcopio de la manera que se indica a continuación.

Fijaciones del osciloscopio	Barrido	:	0,5 useg.
	Voltaje	:	0,5V
	Selector de potencia de entrada	:	CA

(5) Conectar el canal 1 del osciloscopio a TJ301 o al punto de prueba y TIERRA A TJ301 del punto de pureba RF (TIERRA).
(6) Encender el interruptor de la fuente de energía del tocadiscos.
(7) Escuchar la audición de la pista 6.
(8) Fijar el tocadiscos en el modo de audioreproducción como muestra la figura con cuidado de no agitarlo o golpearlo.
(9) Manteniendo el tocadiscos en el modo de audioreproducción, colocarlo según muestra la figura (Aguantándose sobre su lado izquierdo).
(Nota): Si se le hace aguantar sobre el lado derecho, el ajuste no se puede hacer debidamente.
(10) Verificar si la forma de onda de señal RF es como muestra la figura (NG). Si no se puede verificar la forma de onda o no se da con regularidad, tomar los siguientes pasos.
(11) Fijar la llave allen (SZZP104C)...1,5mm) en la cartela de las cabezas de los tornillos de ajuste mecánico como se muestra en la figura y hacer girar ambos tornillos a la derecha o a la izquieda hasta obtener la mejor posición.
(12) Desconectar el interruptor de fuente de anergía del tocadiscos.
(13) Asegurar los dos tornillos de ajuste con pintura aseguradora (RZZ0L01) al completar el ajuste.

10. CHECKING PROCEDURE FOR THE WHOLE ELECTRICAL CIRCUIT (IN TROUBLESHOOTING)
10. PRÜFVORGANG FÜR DIE ELEKTRISCHEN SCHALTKREISE (FEHLERSUCHE)
10. PROCÉDURE DE VÉRIFICATION POUR L'ENSEMBLE DU CIRCUIT ÉLECTRIQUE (LORS D'UN DÉPANNAGE)
10. PROCEDIMIENTO DE VERIFICACION PARA TODO EL CICUITO ELECTRICO (PARA SOLUCION DE DIFICULTADES)

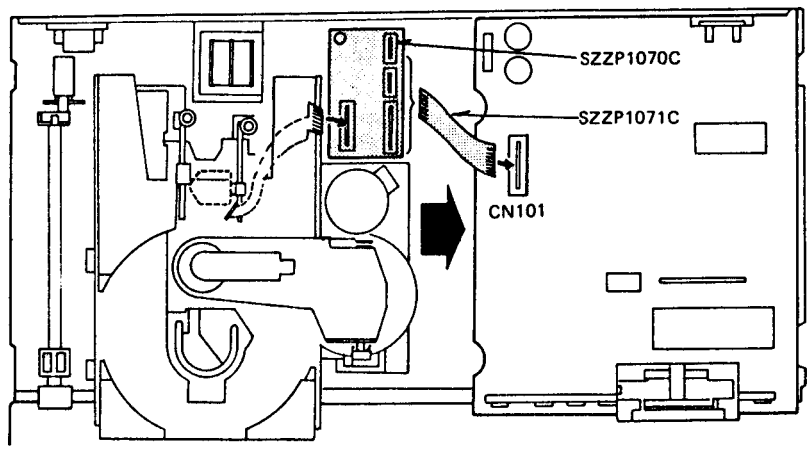


Fig. 33

ENGLISH

The FPC cord from the optical pick-up is too short to check the back of the main PCB with case. Use the servicing fixture **(SZZP1070C) and (SZZP1071C)** and follow the procedure shown below. This fixture is not a must for performing electrical and mechanical adjustment.

(1) Disconnect the FPC cord from **CN101.**
(2) Attach a clip to the top end of the FPC cord. Do this within seconds after cord disconnect. (This is for protecting the optical pick-up against the breakdown due to static electricity.)
(3) Remove the four main PCB fastening screws.
(4) Shift the main PCB to the right side.
(5) Attach the servicing fixture **(SZZP1070C)** as illustrated.
(6) Connect the FPC cord from the optical pick-up to the connector to the fixture. (The other connectors are for the SL-P1200. Do not get them mixed up with the above connector.)
(7) Connect the junction FPC cord **(SZZP1071C)** to the output connector from the fixture, then connect the cord to CN101 on the main PCB. Each part on the back of the main PCB can easily be checked now.

DEUTSCH

Die Kürze des elastischen Steckkontaktkabels erlaubt keine Überprüfung der Rückseite der Haupt-Schaltplatte, ohne daß das Gehäuse abgenommen wird. Wartungsvorrichtungen SZZP1070C und SZZP1071C verwenden und wie unten gezeigt vorgehen. Die Wartungsvorrichtung ist bei elektrischen und mechanischen Einstellungen nicht unbedingt nötig.

(1) FPC-Kabel von CN101 abnehmen.
(2) Am Ende des FPC-Kabels unverzüglich nach dem Ausstecken eine Klammer anbringen. (Die Klammer schützt den optischen Abnehmer vor statischer Elektrizität. Sie ist aber nicht unbedingt nötig, wenn bei der Wartung eine Schutzmatte oder ähnliches verwendet wird.)
(3) Die vier Halteschrauben der Haupt-Schaltplatte abnehmen.
(4) Haupt-PCB nach rechts schieben.
(5) Die Wartungsvorrichtung (SZZP1070C) wie gezeigt anbringen.
(6) FPC-Kabel vom optischen Abnehmer am Stecker der Wartungsvorrichtung anbringen. (Die anderen Stecker sind für SL-P 1200. Bitte nicht verwechseln.)
(7) Außerdem das FPC-Verbindungskabel (SZZP1071C) am Ausgangsstecker der Vorrichtung anbringen und das Kabel mit CN101 auf der Haupt-Schaltplatte verbinden. Alle Teile auf der Rückseite der Haupt-Schaltplatte können nun leicht überprüft werden.

FRANÇAIS

Le câble à circuit imprimé flexible de la tête de lecture optique est trop court pour pouvoir vérifier le dos de la plaquette à circuits imprimés principale. Utiliser les dispositifs de dépannage (SZZP1070C) et (SZZP1071C), et suivre la procédure indiquée ci-dessous. Ces dispositifs ne sont pas nécessaires pour effectuer des réglages électrique et mécanique.

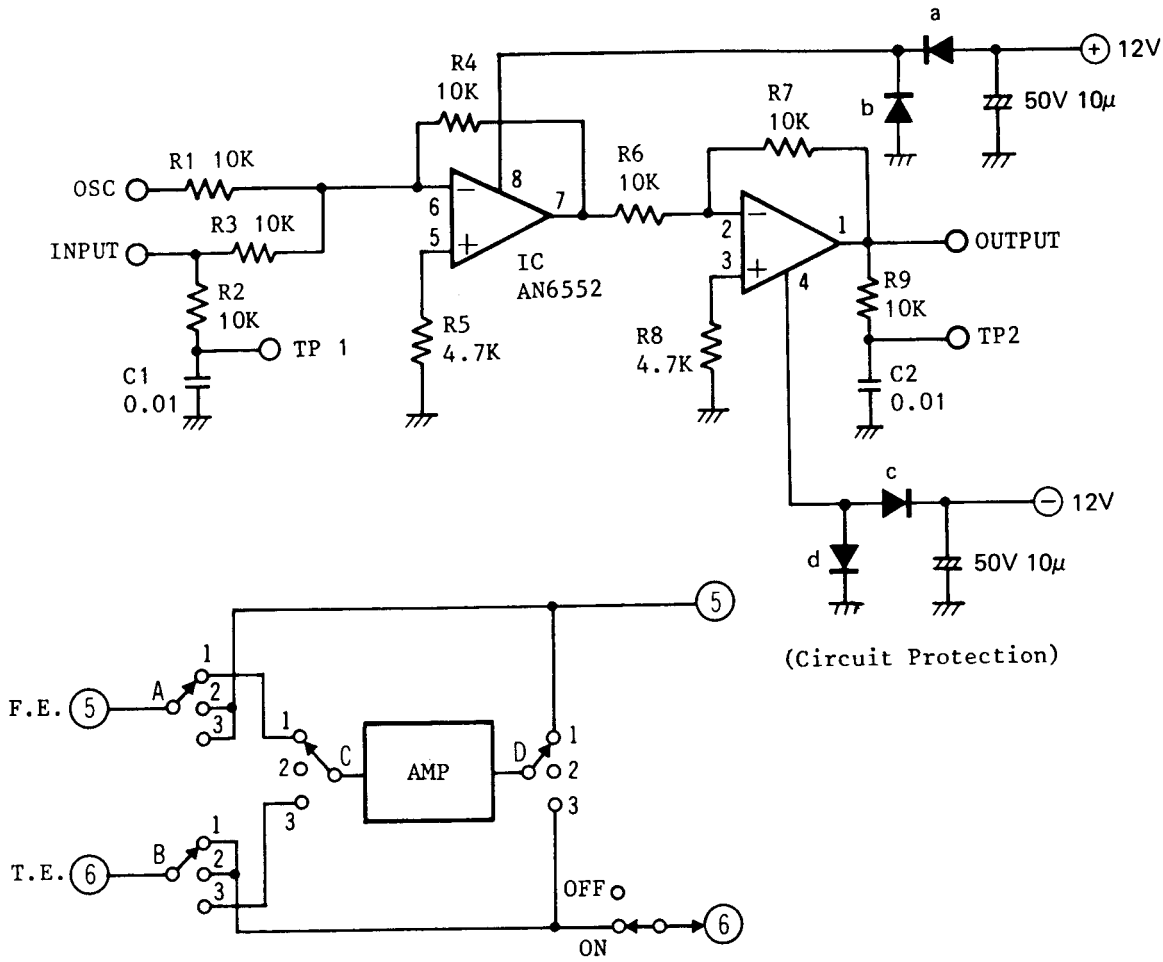
(1) Débrancher le câble à circuit imprimé flexible de CN101.
(2) Fixer une patte d'attache à l'extrémité supérieure du câble à circuit imprimé flexible. Effectuer cela en deçà de quelques secondes après avoir débranché la câble. (Ceci est pour protéger la tête de lecture optique d'une panne due à l'électricité statique.)
(3) Retirer les quatre vis de fixation de la plaquette à circuits imprimés principale.
(4) Déplacer la plaquette à circuits imprimés principale vers le côté droit.
(5) Placer le dispositif de dépannage (SZZP1070C) comme il est illustré.
(6) Raccorder le câble à circuits imprimés flexible de la tête de lecture optique au connecteur du dispositif de dépannage. (Les autres connecteurs sont pour le SL-1200. Ne les mélanger pas avec la connecteur ci-dessus.)
(7) Raccorder ultérieurement le câble à circuit imprimé flexible de jonction (SZZP1071C) au connecteur de sortie du dispositif de dépannage, puis raccorder le câble à CN101 sur la plaquette à circuits imprimés principale.
Chaque élément au dos de la plaquette à circuits imprimés principale peut maintenant être facilement vérifié.

ESPAÑOL

El cable FPC desde el colector óptico es demasiado corto para verificar la parte trasera de la tablilla de circuítos impresos principal en la caja. Usar la pieza de servicio (SZZP1071) y (SZZP1071C), siguiendo el procedimiento que se muestra abajo. Esta pieza de servicio no es relativamente de importancia para la realización de los ajustes mecánicos y eléctricos.

(1) Desconectar el cable FPC del CN101.
(2) Enganchar una presilla en el extremo superior del cable FPC. Hacerlo unos segundos después de desconectar el cable (Es para proteger el colector óptico de averiarse por causa de la electricidad estática.)
(3) Quitar los cuatro tornillos que aseguran la tablilla principal de circuítos impresos.
(4) Hacer deslizar a la derecha la tablilla principal de circuítos impresos.
(5) Poner la pieza de servicio (SZZP1070C) como muestra la figura.
(6) Conectar el cable FPC desde el captador óptico al conector de la pieza de servicio. (Los otros conectores son para el SL-P1200). No mezclarlos con dichos conectores).
(7) Conectar además el cable FPC de unión (SZZP1071C) al; conector de potencia de salida de la pieza de servicio, y luego a CN101 de la tablilla principal de circuítos impresos. Ahora se podrán verificar fácilmente los componentes de la tablilla principal de circuítos impresos.

11. SCHEMATIC DIAGRAMS OF SERVO GAIN ADJUSTER (SZZP1017F)



Ref. No.	Part No.	Q'ty
IC	AN6552	1
R 1,2,3,4,6,7,9	ERDS2TJ103	7
R 5,8	ERDS2TJ472	2
C 1,2	ECKD1H103ZF	2
C	ECEA1HU100	2
Connector	SSDJB13BXHA	1
Lead Wire	(180,600mm)	2
3 Wire with		1
a b c d (Diode)	MA162	4

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ORDER NO. HAD8610732S0
A6

Service Manual

Supplement

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

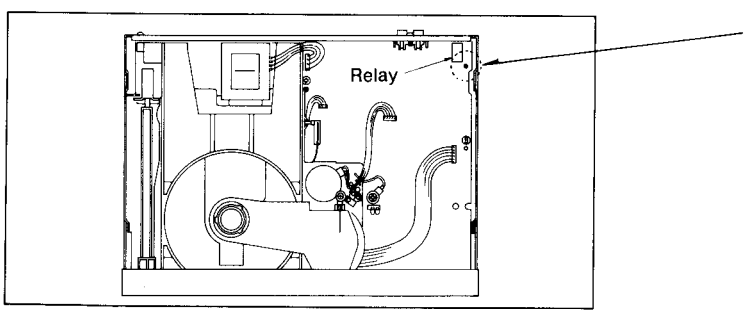
SL-PJ20

SL-PJ20

Please use this manual together with the service manual for Model No. SL-PJ20, Order No. HAD8608682C0.

Notes:
- ★ The muting circuit relay was changed partway through production from a 6V drive relay to a 12V drive relay.
- ★ This unit is manufactured to use either relay.
- ★ When exchanging the relay during servicing, take particular care to follow the instructions below describing how to distinguish between the two relays.
- ★ This supplement should be filed with the service manual for Model No. SL-PJ20. (Order No. HAD8608682C0.)

■ HOW TO DISTINGUISH BETWEEN THE 6V DRIVE RELAY AND 12V DRIVE RELAY



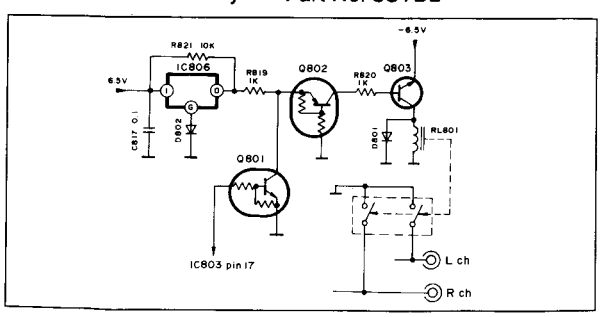
(Upper view of unit after removal of top case)

Units with a red mark near the lower side of the relay were manufactured using a 12V drive relay (Part No. SSYD3)

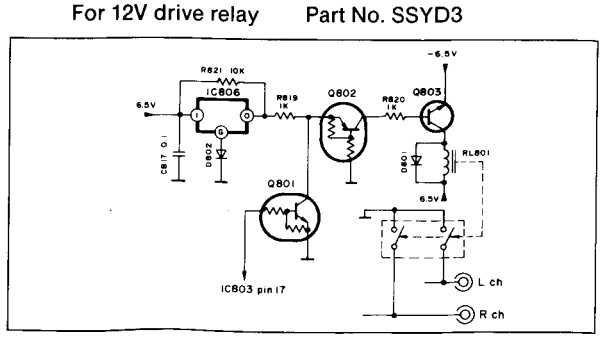
Note: The 6V drive relay and 12V drive relay look exactly the same. They cannot be distinguished by appearance or shape.

■ SCHEMATIC DIAGRAM

For 6V drive relay Part No. SSYD2



For 12V drive relay Part No. SSYD3



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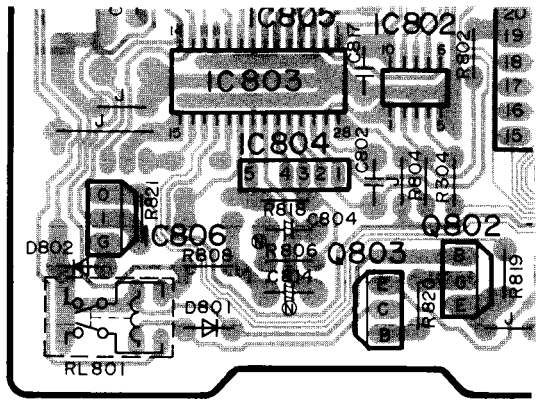
■ PRINTED CIRCUIT BOARD AND SERVICE

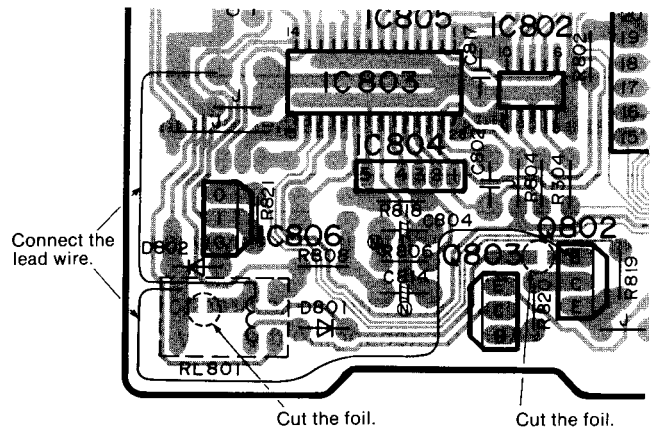
When a 6V drive relay (Part No. SSYD2) is used

• Printed circuit board



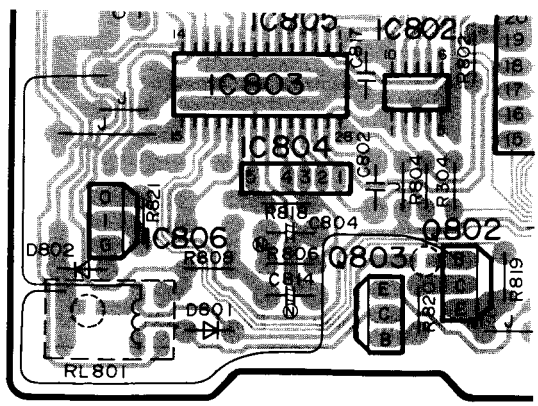
• Service

1. To replace with a 6V drive relay (Part No. SSYD2).
   - Detach the relay. Replace with another of the same type.
2. To replace with a 12V drive relay (Part No. SSYD3).
   - Cut the foil on the P.C.B. as shown in the figure below.
   - Connect the 2 lead wires as shown below.



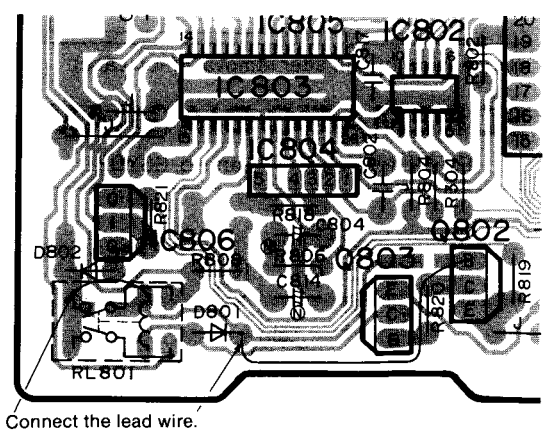
When a 12V drive relay (Part No. SSYD3) is used

• Printed circuit board



• Service

1. To replace with a 12V drive relay (Part No. SSYD3).
   - Detach the relay, and replace with another of the same type.
2. To replace with a 6V drive relay (Part No. SSYD2).
   - Detach the 2 lead wires.
   - Attach the 2 lead wires at the place shown in the figure below.



■ REPLACEMENT PARTS LIST

Ref. No.	Part No.	Description	Remarks
RL801	SSYD2	Muting Relay	6V Drive Relay
RL801	SSYD3	Muting Relay	12V Drive Relay

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